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DELEGATES TO THE 2ND PAN-AMERICAN SCIENTIFIC CONGRESS, WASHINGTON, D. C., DECEMBER 27TH TO JANUARY 8TH.

John R. Mohler, Bureau of Animal Industry, Washington, D. C.
N. S. Mayo, 4753 Ravenswood, Chicago, Ill.
A. R. Ward, Bureau of Animal Industry, Washington, D. C.

THE SECOND PAN-AMERICAN SCIENTIFIC CONGRESS

More than one thousand delegates from the twenty-one American Republics and a large gathering of diplomats, scientists, and interested spectators witnessed the calling to order of the second Pan-American Scientific Congress in Continental Memorial Hall, Washington, D. C., on December 27, 1915. The background was a beautiful collection of the flags of all the Americas, with guards in the uniforms of the United States Army, Navy and Marine Corps in attendance, giving additional color to the ensemble.

From this opening session to the closing banquet on January 8, 1916, various members of our profession, and particularly the committee appointed by President Archibald as delegates from the A V. M. A., consisting of Doctors Mayo, A. R. Ward and Mohler, as well as the committee appointed by President Dyson of the U. S. L. S. S. A., consisting of Doctors Eichhorn and Gilliland, took an active part both in the scientific and social proceedings.

The purpose of this Congress was to bring into close and intimate contact the leaders of scientific thought and of public opinion in the American Republics to the end that by an exchange of views, results might be reached which would be of service to the peoples of the American continent in producing permanently a friendly and harmonious coöperation. The Congress specially recommended the establishment of an intellectual Pan-American Union to unite the various associations in the different countries of a technical, legal, medical, veterinary, etc. character, declaring that such an organization would lay broad and deep the true foundations of intellectual Pan-Americanism.

Not only scientists but statesmen of note were present and exchanged opinions on matters of special and of general interest. Larger views of large questions were presented to take the place of opinions that had served their day. If what may be called political and governmental questions somewhat overshadowed strictly scientific questions it was with the consent of the scientists present. They, as others, recognized the fact that the momentous new times had put grave problems of statecraft, such as arbitration and international unity, into the foreground and demanded their consideration. And delegates and onlookers alike showed by their attention and applause warm support of all the sentiments expressed.

It is evident that the Congress, which was noted for its spirit

of fraternity, solidarity and common interest, will go down in history for the part it will play in the development of international Americanism, in addition to its contributions to the world of science.

The Congress was divided into nine sections and these into forty-five sub-sections. Speeches were made in Spanish, Portugese, French and English.

On account of the keen interest in and the importance of the Pan-American topics under consideration by Section III, in which our profession was most vitally interested, it was found necessary to hold an extra meeting of the section, at which time the following resolutions were passed and subsequently adopted by the Congress, which recognized the need of uniform livestock sanitary regulations and believed that the time was propitious for the promulgation of principles which may be readily applied to all the Americas:

The following general principles are recommended for consideration and adoption by all American countries:

I. Each country should maintain a well-organized and competent live stock sanitary service comprising executive officers, field inspectors and a laboratory force.

II. Each country should enforce live stock sanitary laws and regulations, with the view of preventing the exportation, importation, and spread within the country of any infectious, contagious, or communicable disease, by means of animals, animal products, ships, cars, forage, etc.

III. Each country should maintain a thorough live stock sanitary survey to determine what communicable diseases of animals are present, and the localities where they exist. This information should be furnished regularly to each of the other countries at stated periods as a routine feature.

IV. Each country should refrain from exporting animals, animal products, forage, and similar materials, which are capable of conveying infectious, contagious or communicable animal diseases to the receiving country.

V. Each country should enforce measures to prohibit the importation of animals, animal products, forage, and other materials which may convey disease, from countries where dangerous communicable diseases such as rinderpest, foot-and-mouth disease, and contagious pleuro-pneumonia exists, and which have no competent live stock sanitary service. Animals, animal products, forage and sim-

ilar materials from countries maintaining a competent live stock sanitary service may be admitted under proper restrictions, regulations, and inspections, imposed by the importing country.

VI. Each country, through its live stock sanitary service, should endeavor to control, and if possible eradicate, the communicable diseases existing there. There should be an exchange of information as to the methods followed which have proved most successful in combating animal diseases.

VII. Members of the live stock sanitary service of each of the American countries should meet at regular intervals to consult and inform each other regarding the measures taken for furthering Pan-American coöperation in protecting the live stock industry of the American countries.

Among the papers presented in Section III of especial interest to the veterinary profession were the following:

American International Convention of Sanitary Police by Dr. Jose Leon Suarez, Chief, Bureau of Animal Industry, Argentina; The Pan-American topic, "Is it possible to make uniform regulations among the different American countries for the prevention of the introduction and propagation of diseases of animals?—The prevention and extirpation of animal diseases," which was discussed in separate papers presented by Dr. Julio Besnard, Chief of the National Veterinary Service of Chile; Dr. Rafael Munoz Jimenez of Uruguay; Dr. Francisco Etchegoyen of Cuba, and Dr. A. D. Melvin of Washington, D. C. The effect of parasites on the animal industry, by B. H. Ransom, Washington, D. C.; The prevention and eradication of destructive animal diseases and the effect upon agriculture and the meat supply, by A. R. Ward, Washington, D. C.; The function of live stock in agriculture, by George M, Rommel, Washington, D. C.; The role of the dairy industry in a system of national agricultural development, by B. H. Rawl, Washington, D. C.; The horse in rural industry and recreation by Carl W. Gay, Philadelphia, Pennsylvania; How an animal grows, by H. J. Waters, Manhattan, Kansas; and the swine industry, its importance in agricultural development, by D. C. Wing, Chicago, Illinois.

The program of Section VIII on Public Health and Medical Science, was likewise of interest to our profession, especially the following papers: Problems of insect-borne diseases in Pan-America, by Juan Guiteras of Cuba; Present views in respect to modes

and periods of infection in tuberculosis, by M. P. Ravanel, Columbia, Missouri; The etiology and prevention of beri beri, by E. V. Vedder, Washington, D. C.; A safe and sane milk supply, by John Weinzirl, Seattle, Washington; A symposium on cancer research with 15 papers by different authors, attacking the problem from different angles; A symposium on life histories of protozoa with 11 papers covering amoebae, intestinal flagellates, cultivation of the parasite of rabies, trypanosomes of Venzuela, animal parasites of Paraguay, etc.; The relation of modes of infection to the control of bacterial diseases in Pan-America, by M. J. Rosenau, Boston, Massachusetts.

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THE BUREAU OF ANIMAL INDUSTRY

The report of the Chief is of more than usual interest because of the abnormal conditions existing in the animal population in various parts of the country relative to the outbreak of foot-and-mouth disease. In spite of losses there seems to have been gains. The meat inspection showed an increase over the two preceding years. More than 58,000,000 animals have been slaughtered and over seven and one-half billion pounds of meat and meat-food products have been prepared under inspection.

The experimental work for the control of hog cholera has shown that eradication in limited areas may be accomplished by inoculation with protective serum and proper quarantine measures. A general effort to eradicate this disease from the whole country would be a tremendous and expensive undertaking and would require more effective state laws and organizations.

The outbreak of foot-and-mouth disease, methods of eradication, losses and recurrence of the outbreak are referred to in detail. The total appraised value of the animals slaughtered in the process of eradication up to June 30, 1915 amounted to $5,243,138.55. There were additional expenditures for the disposal of the carcasses and property distroyed in disinfection. One-half of the expense has been paid by the department, but additional sums have been paid for salaries of inspectors, traveling and other expenses.

The eradication of the southern cattle ticks has made good progress and a considerable area has been released from quarantine. The work is receiving a more hearty support from the people and as the areas are cleared efforts are made to build up the beef and

dairy industries. The eradication of scabies of cattle and sheep in the West is also progressing favorably.

The dourine investigations by the complement-fixation test in diagnosing 52,896 samples of blood showed only 2.7% positive as against 4.9% the preceding year.

In anthrax vaccination important experiments have been conducted in the preparation of immune serum to be used in connection with the spore vaccine for immunization. Horses were employed for the preparation of the serum. The serum is injected simultaneously with the spore vaccine and renders only one handling of the animal necessary. The method has been tested in outbreaks of anthrax with very favorable results. A still more interesting feature is the apparent curative value of the serum. Animals suffering from anthrax with a temperature of from 105° to 107° recovered after the injection of the serum in doses of from 50 c. c. to 150 c. c.

Forty-five per cent more blackleg vaccine was distributed than during the previous year. It is the opinion of the chief that this does not indicate that the disease is on the increase but that stockmen are coming to recognize the practicability and value of vaccination.

The physiological investigation of immature veal has been brought to a close. The study of the comparative chemical composition of mature beef and immature veal disclosed no differences that were physiologically significant. In a large number of artificial digestion experiments the veal was digested as rapidly as beef. Feeding experiments on cats gave no indication of harmfulness of immature veal.

Another important discovery is that the viability of trichinae may be destroyed by refrigeration. Infected meat kept at 5°F for a period of ten days destroyed its infectiousness, but a period of twenty days is recommended in order that there may be a proper margin of safety. This should result in much economy for the department as it renders unnecessary an expensive microscopic inspection of pork products prepared customarily to be eaten without cooking.

The personnel of the bureau on June 30, 1915 numbered 4,106, an increase of 534 over the previous year. Of these 2,726 were in the meat inspection service.

The accredited list of the bureau now includes 21 American and 8 foreign veterinary colleges. During the session of 1914-15

there were 2,550 students enrolled in the American colleges, an increase of 106 over the preceding session. Of these 698 were graduated, 14 more than the year before.

In the infectious abortion of cattle the most important results of the year's work is the positive demonstration that the placentas of cows which have aborted are sometimes infected with abortion bacilli at subsequent normal purturitions. This indicates that it is relatively easy for abortion disease to be carried into clean herds through the agency of apparently normal cows of which the abortion history is not known.

In addition to meat inspection and the diseases of animals considerable attention has been devoted to investigations promoting the production of all the domesticated animals including poultry, also animal nutrition and dairy products. The work has been extensive and the report is well worthy of perusal, especially by stockmen and others, who during the hurricane of the foot-and-mouth disease charged that the bureau was an agency for the suppression of animal industry.

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EUROPEAN CHRONICLES

Bois Jerome.

Slow Rupture of Arteries.—In the conclusion of an interesting article that appeared in the *Presse Medicale*, the question was asked by the author, what were the anatomical troubles that could have given rise in a few weeks to the coats of an artery which had not been injured and cause it to finally give way in some parts of its course and be accompanied by slow rupture and hemorrhage?

To this question, Prof G. Petit of Alfort, has answered in considering the histological mechanism of these slow ruptures, summarizing a report which he had already made to the Societe d'Anatomie. viz: that of a case of fatal secondary hemorrhage of the external pudic artery which had occurred in a horse that had been operated on for a big double chronic inguinal hernia. The sequela of the operation looked normal when suddenly one morning, twenty days after the operation, blood escaped freely from the scrotal incision and after a few minutes the exhausted animal dropped and, notwithstanding packing of the parts, died in a few minutes.

Postmortem was made immediately and revealed no other lesion explaining death than the hemorrhage by arterial rupture.

The edges of the wound, filled with a big clot were granulating normally, but in separating them, there was found a separation between the abdominal walls and the skin which was filled with a mass formed of pus and pieces of necrosed tissue, having a very offensive odor. Minute examination of the walls showed them covered with soft granulations and at the bottom of a slight depression, concealed by pus, a longitudinal orifice, opening in the lumen of an artery, as big as a lead pencil with edges grayish, almost straight but slightly bent outward.

Sections made at various levels, permitted one to trace the course of the artery and to identify it through the fibro-lardaceous tissue where it ran. It was the external pudic artery, which had ruptured a little below the point of origin of the posterior abdominal.

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After thus briefly recalling this case, Prof. Petit goes on with the histological and pathogenic study of the arterial fragments collected and saved.

A cut made on a level with the arterial rupture showed the alterations of the walls, which explained why it could suddenly give away under the pressure of the blood.

The edges of the solution of continuity were irregularly arranged and bent outwards by the elasticity of what remained of the middle coat.

In about one-half of the circumference, the walls of the artery were normal. It was in continuity with the surrounding connective tissue which by inflammation had become lardaceous.

On the contrary the other half projecting in the wound was in close contact with pus. Its structure was much altered. The periartery had completely disappeared, the mesartery was thin and torn in some points: only the internal elastic coat had remained intact, also the deeper fibres of the elastic structure. The smooth muscular cells were in a necrosis of coagulation and even in the most extreme curves were replaced by infiltrated leucocytes.

The endartery, much thickened and already fibrous, alone formed the entire wall on a level with the weak point of the mesartery and was already invaded by the pus.

Such were the arterial lesions revealed by the microscope.

The pathogeny is easily made out by a close histological study of the blood vessel. It can be summarized as follows: suppuration

invaded the periarterial connective tissue, which promoted the process preceding the denudation of the vessel. The destruction of the external coat, when it took place, is fatally followed by other disorders.

The mesartery, now in contact with the suppuration, directly impregnated by microbian toxins, and besides without the vasa vasorum which fed it, becomes degenerated. Necrosis of the smooth muscular cells follows from the outside inwards and as a consequence the elastic structure loses its resisting force. The endartery is in turn affected, by the toxins which penetrate through the middle coat, reacts and becomes thicker.

The arterial wall at the point where it is in contact with the pus, is then exclusively formed: 1° of a very thick fibrous reacting endartery, 2° by a degenerated necrosed mesartery, infiltrated with pus in its external layers and exposed to a sudden distension and rupture.

Under the pressure of the blood the endartery thick and entirely fibrous may be distended, the mesartery degenerated and at its extreme limit of resistance, breaks here and there in fissures and then in places the endartery is in direct contact with the pus which penetrates through it.

The dilatation progressively is more accentuated and finally, suddenly the endartery gives away, where there is less resistance.

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The preceding study brings in evidence the properties of the three arterial coats, so closely separate from each other.

The mesartery, functionally the most important coat, elastic, contractile, highly differentiated, nourished and protected, externally by the periartery, inside by the endartery, unable to react to consolidate itself never undergoes degeneration, except secondarily. To become affected, pus must have first destroyed the periartery or adventitious coat.

The degeneration of the contractile cells, the destruction and progressive separation of the elastic lamaellae and net-work is followed by the hypertrophy of the internal coat, threatened by the sudden danger of rupture. But this hasty and imperfect consolidation cannot resist the progressive dilation of the artery under the pressure of the blood, the external coat being entirely destroyed and the middle one degenerated. Then the blood vessel gives way on a level with the weak spot.

JOHNE'S DISEASE.—In my last chronicle, the contents in the September number of the *Journal* of McFadyean, I took up the excellent article by Prof. Merillat on respiratory anesthesia of animals.

But there was another article also of great interest, viz: the records made from the research laboratory of the Royal Veterinary College, of twelve cases of Johne's Disease, which had been submitted to the drug treatment of ferrous sulphate and dilute sulphuric acid for various lengths of time.

Signed by such authorities as Sir John McFadyean, A. L. Sheather and J. T. Edwards, the report is made with minute consideration of the manifestations offered by the animals, with the descriptions of the lesions found at the post mortems of the cows, the microscopic examinations, etc., with the discussions of the results, all handsomely illustrated, and ends with the following conclusions:

"In many cases of Johne's disease, treatment with ferrous sulphate is followed by improvement, the diarrhea being checked and the loss of condition arrested.

"In the majority of such cases, the improvement is not very great, and the disease soon resumes its ordinary course. In some cases the treatment fails to effect even a temporary improvement or check the diarrhea ond loss of condition. In a minority of cases, the treatment has surprisingly beneficial results, suggesting even a complete recovery with disappearance of the diarrhea and restoration of the animal from a state of emaciation to excellent condition. Even in the last class of cases, a relapse which does not yield to a repetition of the treatment is likely to occur and it is doubtful whether the treatment ever effects an absolute cure.

"In view of the uncertainty and of the slow recovery of weight in the most favorable cases, treatment cannot be advised except in special circumstances.

"As a rule, the most economical plan is to destroy the subjects of Johne's disease as soon as the disease is manifested by clinical symptoms. This course is indicated not only by the uncertainty and expense of the treatment but also clinically diseased animals, even when under treatment are highly dangerous, unless strictly isolated.

"In the case of specially valuable animals, such as pregnant pedigree cows, treatment may justifiably be tried, in the hope that

it may carry the animal over the period of parturition, even if it does not effect a cure.

"The treatment may also be justified in cases in which the disease has been diagnosed in apparently healthy animals by testing with avian tuberculin or "Johnin" and their slaughter is not considered expedient by the owner."

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DYEING WAR HORSES.—This question is one of great moment and is of importance to reduce as much as possible their visibility. Many experiments have been made and several of the results obtained have been recorded in daily and scientific papers.

Doct. Bouchet, Major Veterinary has presented before the Societe de Pathologie Comparee a method which has given him great satisfaction and which indeed commends itself by its simplicity of application, the excellent dark brown chestnut coloration it gives to the coat of the animal, its lasting hue, its harmless condition to the horse, and its very reduced cost.

The author has made many experiments with permanganate of potash, nitrate of silver, picric acid, sulfuret of copper, methylen blue, tannate of iron, sulfuret of mercury; but finally adopted the method he recommends which consists in fixing on the hairs an insoluble black sulfuret of lead, obtained by the successive application of polysulfuret of potash and one of neutral acetate of lead (Goulard's extract). These salts are used in solution of 5%.

The surface of the body of the horse is first impregnated with one or the other of the solutions, it matters not which it is, but with animals having a very fine delicate skin, it is better to employ the acetate first. No previous soaping or scrubbing is necessary and some times is even injurious.

The solution is poured slowly in small quantity over the body, with a hair brush it is slowly and carefully rubbed in, in the direction of the hairs or against them, so as to make the imbibition as thorough and equal as possible. Hard rubbing is not necessary, especially in the places where the skin is thin such as the face, the points of the ischium and the internal portion of the legs. It generally takes one hour to make the application properly. Three litres of solution are necessary and sufficient.

The chemical reaction of the two salts should take place, not only on the surface of the coat, but even in the structure; it is necessary to wait for the first imbibition to be thoroughly dried.

Exposure of the animal to the sun will secure that condition easily.

After about one hour the surface of the body has become perfectly dry and is ready for the application of the second solution, which is applied in the same manner and care as the first. The same brush can be used after thoroughly soaking and cleansing with pure water.

The horse is then exposed to the sun for a while and afterward taken to his stall.

The next day his coat is of a dark burnt chestnut color. The ordinary grooming can be carried out. Another application of the solutions made the following day or later will darken the coloration.

The coat of the animal remains the same tint until it is shed or when the hairs drop.

No organic trouble has ever been observed by this dyeing method and the skin has kept up its suppleness.

The solution used can have a very beneficial effect upon animals that suffer with mange and pityriasis.

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CARTILAGE GRAFTING.—This has been the subject of a communication before the Societe de Chirurgie by Doct. Morestin, a subject which is of importance in its application. Recorded in the *Presse Medicale* I make extracts from it.

First of all the author recalls that the grafting of cartilaginous tissues has already been done in surgery, especially in rhinoplasty. And then putting that question aside, he desires to call attention to the use of such grafting as he has lately had the opportunity to do in the repairing surgery of the facial or cranial skeleton.

Before the exhibition of specimens upon which such grafting had been made he presented some concise general indications demanded for such operations.

Any of the cartilages can be used. Practically the costals and especially, in a limited number, those of the 6th, 7th and 8th ribs are the ones most easily taken.

The resection of the cartilages is never followed by serious sequelæ, provided care is taken and if by the application of the sutures, the musculo-aponeurotic layer is properly preserved and built up again. Even after the removal of the three cartilages, above mentioned, no accidents, no inconvenience, no lasting respiratory difficulty, no tendency to hernia and no pain have been observed by the author.

The first advantage obtained by these collected cartilages cannot be compared with those of any other similar operations, especially in the rebuilding of the cranio-facial skeleton. The costal cartilage can be easily cut with the bistoury into little bands or baguettes or flexible arches which can be twisted in all shapes so as to be adapted to their proper destination. No assistant, no special instruments are necessary to prepare the pieces that are to be used in this kind of operation.

Notwithstanding this facility of being worked, cartilage offers great resistance and every graft soon takes the place of bony tissue.

The transplanted pieces become really grafted, live their normal life, and rapidly become adapted to the new condition of existence.

This grafting always succeeds even when, so to speak, that of bones is so difficult to obtain. Not only is immediate success the rule, but it is lasting. The grafted cartilage lives indefinitely without being resorbed and without appreciable diminution. This is important, because in practice one does not have to count upon the reduction in the size of the grafted fragments, which can be prepared with exact and rigorous proportions.

The grafts can be obtained from any other subject and will succeed as well as if they were taken from the operated subject himself. Although it is less certain that he will not show some dystrophia or some reduction.

In cases where cranioplasty was indicated all the cases where it was performed have been successful. By the use of these cartilaginous grafts Morestin has obtained wonderful results in the surgery of cranial injuries, of crushing of the frontal region, of building up injuries of malar bones, of the orbits or of the maxillary bones in which the bones had been crushed and removed.

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CONTAGIOUS EPITHELIOMA IN CHICKENS.—There are in several states of North America, agricultural stations which are more or less intimately connected with the universities of the states where they belong. Not infrequently there are published by the officers, I mean the veterinarians and their colleagues, bulletins which contain the results of their work and are full of valuable practical information.

Doctor Winfred B. Mack, veterinarian and bacteriologist with Doctor Edward Records have favored me with a copy of Bulle-

tin No. 82 published by the University of Nevada, upon the control of contagious epithelioma in chickens by vaccination. In a few pages the subject is treated by an introduction first, the consideration of the identity of the disease, the treatment by vaccination with records of the results obtained. The little pamphlet is summarized in the following conclusions:

"The etiological identity of roup, avian diphtheria, and contagious epithelioma is a subject of controversy which requires further extended research to settle. For that reason it is uncertain whether the cases dwelt on in the experiments were caused by pure contagious epithelioma virus or were due to mixed infection.

"The use of a virus prepared by triturating the morbid products collected from the skin and mucous surfaces and attenuated at 55°C for an hour, checked the spread of the disease promptly and exercised a favorable influence upon visibly infected birds. Cases thus treated ran a shorter and milder course than those not treated and the mortality was materially reduced.

"Two injections were sufficient in most instances but severe or advanced cases were benefited by a third and larger dose.

"In five flocks containing 3062 birds, 1608 of them thoroughly exposed and 1394 or 45% of them visibly infected the spread of the disease after vaccination was negligible. Of the 1394 visibly infected birds 299 or 24.45% died and 1095 or 78.55% recovered.

"On the whole, the treatment was satisfactory and successful. In five flocks no unfavorable results followed the subcutaneous administration of the vaccine but in two flocks serious toxic and septic processes were apparently caused by it. The crude preparation used is not, therefore without danger and a more refined product must be desired. However, the conclusion that in this method we have a fairly efficient manner for promptly checking outbreaks of contagious epithelioma or the other uncertainly defined diseases, if there be more than one capable of producing a similar morbid condition of fowls and a therapeutic agent of considerable value, appears warranted. Furthermore, that the prevention and control of the disease or group of diseases may eventually be placed on a sound scientific basis seems certain."

BIBLIOGRAPHIC ACKNOWLEDGEMENTS.—Collected papers from the Research Laboratory of Parke, Davis & Co., Reprints, Vol. 3. A very interesting volume and collection of scientific information of great value published by and under the direction of Dr. E. M. Houghton.

Investigations upon the occurrences of onchocenciasis in cattle and associated animals in countries other than Australia by George Swelt, lecturer on biology and parasitology in the University of Melbourne.

Investigations into the cause of worm nodules (Onchecerca Ciboni) in cattle by J. F. McEachran, M.R.C.V.S., and Gerald F. Hill, F.E.S., of the northern territory of Australia.

Rapport of the Service Veterinaire Sanitaire by H. Martel. Bulletin 240 from B. A. Industry on pasteurizing milk in bottles and bottling milk pasteurized in bulk by S. Henry Ayers and W. E. Johnson.

Bulletin 259 from the B. A. Industry on studies on changes in the degrees of oxidation of arsenic in arsenical dipping in baths by Robert M. Chapin.

A. L.

RABIES IN THE WESTERN STATES. The rabies situation in Nevada and adjoining states has become very serious. The coyote introduces a very troublesome element in the matter of control. The public health laws of the localities concerned appear to be inadequate for the situation and as the matter is more extensive than the live stock laws contemplated relative to public health, some arrangement by mutual agreement with local officers to overcome the deficiencies in the law is necessary.

Through the efforts of Dr. Mack, the U. S. Biological Survey has fifty men employed in northern Nevada in eradicating coyotes in charge of an inspector and much efficient work has been done. It is planned to have a small army of men in the field to hunt, trap and poison coyotes.

There has been organized a body to be known as the Nevada Rabies Commission to consist of the governor, Dr. Mack and three men to be appointed by the governor. This commission will have charge of the work for the state and as soon as organized will enter into negotiations with the federal government.

It has been decided that the coyote must go between the Rocky mountains and the Sierras. The task is a stupendous one but it is believed the states and the federal government can accomplish it.

FOOT-AND-MOUTH DISEASE WITH SPECIAL REFERENCE TO THE OUTBREAK OF 1914-1915

(Continued from page 419)

Foot-and-Mouth Disease in Foreign Countries

Because of the prevalence of foot-and-mouth disease in Europe and South America, importations of live stock into this country are limited practically to shipments from Great Britain, Ireland, and the Channel Isles. Even with these countries trade has been interrupted several times in recent years, for the government does not permit the importation of animals from countries where the disease exists, and there have been several outbreaks in Great Britain lately.

Up to November, 1906, American ports were open to Belgium and Holland. In that month, however, some sheep were taken into Belgium from France where the disease was quite prevalent and brought the pestilence with them. By the end of the year every province in Belgium was affected, and Holland as well. Since that time both of these countries have been fighting the disease, but have not yet succeeded in eradicating it.

In Italy, France, Switzerland, Germany, and Russia the plague has existed so long and has gained such a foothold that it is economically impossible to fight it with the American methods of slaughter and disinfection, for to do so would be to kill a large percentage of the live stock in these countries. In consequence, the authorities appear to be making little or no progress in their campaign. The outbreak, for example, which appeared in Germany in 1888 increased steadily until 1892 when it diminished gradually for a few years but again reached great proportions in 1899. Thereafter it continued to exist to a greater or less extent until in 1911 it attained a virulence unequaled before. In that year 3,366,369 cattle, 1,602,927 sheep, 2,555,371 hogs, and 53,674 goats were affected. At that time the total number of cattle, sheep, swine, and goats in Germany was only 51,319,000 while there were in the United States 172,572,000, or between three and four times as many. It can readily be imagined, therefore, what it would mean to the United States if the disease were to gain the foothold here that it had in Germany, where, as these figures show, approximately one out of seven of the animals susceptible to the disease was affected.

Since the mortality in the disease is comparatively low, rang-

ing from only 3 per cent in mild forms to 30 or 40 per cent in malignant cases, the havoc caused by the pestilence is sometimes underestimated. From the work of various scientists, however, who have endeavored to ascertain the decrease in value of an animal which recovers from an attack, it may be said that on an average this amounts in Germany to $7 and in Holland to $10. In this country, with its higher prices, the loss would be correspondingly greater. If these figures be accepted, it is obvious that the amount of money spent in eradicating the disease becomes insignificant in comparison with the loss it causes when left to itself.

The German government, of course, has not left the disease to itself. The more recent outbreaks it attempted to control by the American method of slaughter, but the pestilence had gained too much headway and was too firmly established in too many portions of the country for this method to succeed, and the slaughter of the infected herds had to be abandoned. It now appears that there is no hope of getting rid of it until the virus has worn itself out. At present it seems that as soon as the animal's period of acquired immunity is over and favorable conditions present themselves, the contagion breaks out with renewed virulence, so that the authorities have practically abandoned all hope of controlling it by means of quarantines. One scientist, indeed, has asserted that unless all the infected farms were absolutely isolated and the movement not only of live stock but of persons absolutely prohibited, the disease could not be stamped out. Such a quarantine is, of course, utterly impossible to enforce. In certain portions of Germany, in fact, the farmers, realizing that the disease is inevitable, make haste to be done with it by exposing their stock deliberately to mild cases in the hope that this will result in an immediate mild attack and immunity for a certain period thereafter.

Great Britain, Ireland, Norway and Sweden, on account of their comparatively isolated positions, have been more successful in keeping out the disease. The outbreaks in these countries have been more sporadic and by resorting to immediate slaughter the authorities have been able to stamp them out. After being free for twenty-nine years an outbreak occurred near Dublin in 1912, and measures were adopted which were more stringent than any used in this country. As soon as the existence of the disease became definitely known, so-called "stand-still" restrictions were imposed on the affected district. Not only was the movement of

live stock into or out of the district absolutely forbidden, but no cattle, sheep, goats, or swine could move along or even across any highway or thoroughfare.

Moreover, within each of the affected districts, known as "scheduled districts" were two smaller areas in which there were even closer restrictions. One of these areas consisted of the premises on which the actual outbreak had taken place. These premises were declared to be an "infected place." From such a place nothing could be taken of any sort without permission, and no permission was granted until the objects in question had been thoroughly disinfected. No one but the person actually attending the stock was allowed to enter any shed or field in which a diseased or suspected animal had been kept, and the one man who could do so was compelled upon leaving to wash his hands thoroughly with soap and water and disinfect his boots and clothes. He was, moreover, prohibited from caring for any animal which was not diseased or suspected. On farms adjacent to the "infected places" the owners of live stock were ordered to stop all movements of their animals, and these orders together with the other regulations, were enforced through the local constabulary who closely guarded all infected places. This patrol was so strict that it was practically impossible for anyone to pass into or out from the forbidden area without instant detection.

Within the "scheduled districts" house-to-house and farm-to-farm inspection was carried on by veterinary inspectors who not only examined live stock but made a record of the number on each farm in order to detect any cases of surreptitious shipments. Exposed stock was slaughtered, as has been done in all sections where satisfactory progress has as yet been made in stamping out the pestilence.

In addition to slaughtering the stock, farmyards and similar places were thoroughly disinfected; the fields in which the animals had grazed were carefully strewn by machines, with newly burned lime; stacks of hay were disinfected by superheated steam, the foxes in the neighborhood were destroyed as far as possible by poison, and all persons in the neighborhood were compelled to tie up their dogs. The wheels of all vehicles and the feet of horses which left the "infected places" were previously washed with disinfectant fluid, and cans of this liquid were placed about in fields so that there would be no excuse for anyone failing to observe the required precautions.

These methods were successful in stamping out the disease, although there have been one or two minor outbreaks in Ireland since that time. In this connection it is interesting to note that the authorities in charge of the campaign were unable to discover any clue to the origin of the pest. "Foot-and-mouth disease," they reported, "is of such an infectious character and may apparently be carried through so many diverse and elusive ways that in this, as in other cases, it is most difficult to fix on any specific medium of diffusing the infection. The disease was probably carried, for the most part, by persons who had been in contact with infected animals, but the connection between the various cases could not be definitely traced except in one or two instances."

The disease is also more or less prevalent in Denmark, Austro-Hungary, Spain, and in the Balkan countries.

Australia and New Zealand have remained free from it.

We have less accurate information regarding Asia and Africa, but the disease is known to prevail in Japan and China and in the Philippine Islands, and it is doubtful if any considerable part of the Orient is free from it.

Foot-and-mouth disease seems to have become established in the South American republics. It is common in Argentina, Brazil, and Uruguay.

In Brazil it is reported to have caused great losses among the wild deer; some parts of Brazil being almost undiscovered country, it would appear that the disease has passed beyond all official control.

In Uruguay, where Dr. Salmon spent six years as head of the veterinary department of the university of that country, it is stated that cases of foot-and-mouth disease could be seen every week at the abattoirs, although the existence of the disease is not officially reported, but is acknowledged.

According to Professor Lignieres of the Argentina Veterinary Department, all idea of the renewal of exports of live stock from his country to Great Britain may be dismissed for an indefinite period, for he declares that foot-and-mouth disease is permanently established in Argentina. It is stated that not only has the disease spread over the country but it has also assumed a virulent form, causing deaths up to 18 per cent. in herds and flocks attacked. The stock owners have opposed the adoption of rigorous measures for repression of the disease under the hope that it would die out

naturally, and now it threatens to invade the whole of the territory propitious for its development.

Synopsis of foot-and mouth disease in Europe during the past five years

Reports are received from some of the European countries at very irregular intervals, in which cases statements are given below from such reports as have been received.

ENGLAND

Month	1911		1912		1913		1914	
	Out-breaks	Cases	Out-breaks	Cases	Out-breaks	Cases	Out-breaks	Cases
January	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0
March	1	18	0	0	0	0	11	74
April	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
June	0	0	4	38	0	0	0	0
July	6	402	51	246	0	0	0	0
August	1	5	15	128	0	0	3	14
September	1	16	11	187	0	0	8	20
October	9	26	1	37	0	0	2	17
November	0	0	0	0	1	23	0	00
December	1	20	1	9	1	50	3	18
Totals	19	487	83	645	2	73	27	143

BELGIUM

Month	1911 Cases	1912 Cases	1913 Cases	1914 Cases
January	0	2,683	394	660
February	209	1,196	855	742
March	336	702	586	131
April	1,639	822	194	17
May	11,377	333	601	121
June	68,763	206	674	0
July	153,608	94	934	* 17
August	105,532	116	3,166	—
September	62,824	108	5,408	—
October	32,890	16	6,670	—
November	22,215	0	5,173	—
December	7,598	76	3,267	—
Totals	466,991	6,352	27,942	1,688

* Last report received from Belgium.

THE NETHERLANDS

Month	1911 Outbreaks	1912 Outbreaks	1913 Outbreaks	1914 Outbreaks	1915 Outbreaks
January	0	75	16	1	110
February	44	90	13	5	* 88
March	138	62	11	2	...
April	330	31	6	1	...
May	4602	18	3	0	...
June	18214	12	1	0	...
July	12358	2	0	0	...
August	155503	3	0	0	...
September	13477	1	1	0	...
October	4491	0	1	5	...
November	1089	5	2	60	...
December	302	6	3	131	...
TOTALS	70548	305	57	205	198

* Last report received from the Netherlands.

DENMARK

Month	1911 Outbreaks	1912 Outbreaks	1913 Outbreaks	1914 Outbreaks	1915 Outbreaks
January	0	251	0	0	114
February	0	243	0	0	* 181
March	4	132	0	0	...
April	1	67	1	0	...
May	1	50	1	0	...
June	0	34	0	00	...
July	1	8	0	0	...
August	0	0	0	0	...
September	4	0	0	1	...
October	45	0	2	0	...
November	154	0	1	2	...
December	278	1	1	43	...
TOTALS	488	786	6	46	295

* Last report received from Denmark.

NORWAY

No cases of foot-and mouth disease have been reported from Norway in the last five years.

SWEDEN

Month	1911 Premises	1912 Premises	1913 Premises	1914 Premises	1915 Premises
January	0	0	0	0	9
February	0	2	0	0	* 0
March	0	7	0	0	0
April	0	2	0	0	..
May	0	1	0	0	..
June	0	0	0	0	..
July	0	0	0	0	..
August	0	0	0	0	..
September	0	0	0	0	..
October	3	0	0	0	..
November	2	0	0	0	..
December	0	0	0	6	..
TOTALS	5	12	0	6	9

* Last report received from Sweden.

GERMANY

Month	1911 Premises	1912 Premises	1913 Premises	1914 Premises
January	10199	13210	121	367
February	14507	9460	181	386
March	19586	6469	115	302
April	24422	1917	32	308
May	12394	4007	22	1028
June	37297	3138	42	2224
July	57332	1743	68	3731
August	75987	724	30	869
September	72477	223	63	8175
October	68170	198	186	13599
November	53120	172	629	12559
December	26242	226	778	* 5616
TOTALS	471733	41487	2287	49164

* Last report received from Germany.

FRANCE

Month	1911 Premises	1912 Premises	1913 Premises	1914 Premises	1915 Premises
January	0	2959	*	*	*
February	145	1251	*	*	**1733
March	222	687	*	*	*
April	216	463	*	*	*
May	462	684	*	*	*
June	958	1347	*	*	*
July	16027	*	*	*	*
August	33966	1947	*	*	*
September	20729	2747	***22091	*	*
October	14115	3459	*	*	*
November	8527	*	*	*	*
December	5594	*	*	*	*
TOTALS	100961	15544	22091	0	1733

* No reports received to cover such months.

** Report covers from February 21 to March 6, 1915.

*** Report covers from September 28 to October 4, 1913.

SWITZERLAND

Month	1911 Cases	1912 Cases	1913 Cases	1914 Cases	1915 Cases
January	759	1301	1036	2685	1229
February	1013	586	703	1220	904
March	603	620	672	1469	* 559
April	348	256	577	757	....
May	393	428	1226	673	....
June	4796	4267	2505	384	....
July	59805	5903	5588	3119	....
August	109347	3608	10273	3607	....
September	5373	2021	21292	4309	....
October	1515	2096	9906	3326	....
November	1566	1943	9650	777	....
December	1432	1740	5822	1825	....
TOTALS	186950	24769	69250	24151	2692

* Last report received from Switzerland.

ITALY

Month	1911 Localities	1912 Localities	1913 Localities	1914 Localities	1915 Localities
January	57210	14870	15722	3707	1233
February	49091	9053	7291	2337	1123
March	100491	3580	8570	2107	* 838
April	68671	9435	5777	1815	....
May	95625	12831	7302	1217	....
June	406343	3661	11506	439	....
July	112902	3369	16957	1300	....
August	39082	2658	9284	1758	....
September	28373	1880	14046	851	....
October	18232	30905	14238	2146	....
November	29136	81392	8240	1361	....
December	19452	53045	4371	1661	....
TOTALS	1024609	226679	123304	20699	3194

* Last report received from Italy.

AUSTRIA

The status of foot-and-mouth disease in Austria May 31, 1911; 787 districts, 11,013 farms

HUNGARY

The status of foot-and-mouth disease in Hungary May 31, 1911; 1,609 districts, 19,045 farms.

RUSSIA

	Outbreaks	Cases
August, 1910	7,215	590,349
September, 1910	6,225	545,671
October, 1910	4,467	314,759
Totals	17,907	1,450,799
March, 1914	374	26,017

(No report from Russia between October, 1910 and March, 1914, and none since March, 1914 to date).

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ABSTRACT OF DISCUSSION.

DR. HUGHES: I do not wish to discuss this paper from the standpoint of the practitioner and ordinary observer of the disease because that has been exploited to such an extent that it would be time wasted, it would be useless for me to endeavor to bring to your attention the salient features of this disease. But I want to endorse everything Dr. Mohler has said. There are a few little things that probably I might take issue with him upon, but they are so inconsequential that they are better left unmentioned.

This disease, foot-and-mouth disease, I have been observing since I was seven or eight years old. Prior to my taking up the study of veterinary medicine, I had cases to observe—at least three outbreaks on our establishment and in the country surrounding it. I had a chance, in consequence, to become conversant with it early in life. I remember driving a wagon regularly to the fields where the cattle were,—the wagon containing cabbages, that the cattle might be sustained throughout the outbreak. These animals were quarantined under very strict and rigid regulations, and the disease was allowed to run its course, which it did and disappeared, leaving the animals without any mortality, further than the trouble and commercial obstruction incident to the presence of the disease, in the way of quarantines, etc., removal or barter or selling of cattle, shutting down of fairs and markets, the disease at that time was not looked upon as a serious one. Where the disease came from was a problem that was confronting the people. It came ordinarily heralded by newspaper reports intimating that it was at some distant point, say, 100 miles away, and that it might be expected to visit our territory. Ordinarily it came with the regularity of clock work, so that, granting that we had an outbreak, we will say in this year, and that outbreak ran its course, the disease disappeared leaving our cattle in the condition which had previously existed, and did not return until a certain irregular period afterwards—maybe two years—maybe five years. So that it is not to be supposed for a moment that that disease or that outbreak had clung around the establishment or around the locality or neighborhood, but rather that it was brought in. When one comes to ask himself how it is possible that this disease could originate in a state like Michigan where it has originated, he is only asking the question that I have heard asked many times, thirty, thirty-five and forty years ago. So it seems in that respect we are not making any progress in the matter of being able to definitely determine how this peculiar disease appears in a locality, and when probably the next outbreak comes, it will descend upon a community thousands of miles distant.

I have no knowledge, of course, of serum therapy in this disease. Consequently I don't feel that I am in any way competent to discuss it. I am a close reader. There is not anything that has been published on this subject that I have not endeavored to lay my hands upon, and when I could not get it through English channels, I had the matter translated, so that with regard to those dairy show cattle, in the course of time, there will appear a very complete and a very exhaustive report of the handling of those animals. I don't believe that any form of quarantine that could be imposed would control this disease, and as a consequence, I highly endorse the methods adopted by the Bureau of Animal Industry. There is no compromise to be made with me on this subject. But I have been criticised. It has been stated that I have been an obstruction-

ist by associating myself with those dairy herd people to the detriment of the field veterinarian. I want definitely and positively to go on record. I have gone on record before, at the last meeting of the United States Livestock Sanitary Association on this matter, and answered any question put with the regularity of clock work. You have been the obstructionist. I have not been. I want to reiterate here that I associated myself with these dairy people when they were in desperate straits. There was a feeling in Chicago at the time when the disease was discovered at the stock yards and a valuable herd of this kind was on exhibition, that something must be done to save them. The expression was heard abroad: "What of this valuable dairy herd? Why should they be slaughtered as others have been?" Now in the placing of a quarantine, naturally the owners were excluded. Their men to a great extent were excluded. The attendants of these animals were only allowed to converse with outsiders from a second story window. Finally the notion got abroad that these cattle had to go underground, and that got these dairy show people by the ears. As a consequence they sent their manager to me to know whether I would represent them. I want to say again at this meeting that before I concluded to do so, before I would give them an answer in any way, I said: "It has got to be satisfactory to the State of Illinois that I shall associate myself with you" and also to the Washington authorities. I saw the state veterinarian of Illinois. He said: "It will please me immensely if you will act as a go-between". Then I called up Washington by long distance, and I got Dr. Mohler on the telephone. I told him what the existing conditions were in regard to this herd. That there were probably thirty cattle at that time of the dairy show stock which had been removed from the infected quarters to the hospital where they were segregated. Dr. Mohler stated that in his opinion it might be well for me to ally myself with those people, and he gave me some directions as to how, in his opinion, I should endeavor to counteract the disease. So that, you should not accuse me of playing false to the profession, and of being an obstructionist. I am not in any sense. I merely allied myself with those people with the object of endeavoring to determine as to whether or not these cattle could be saved. You understand that if they were slaughtered, the dairy industry of this country would be set back probably fifty or a hundred years, because there are cattle in that herd of inestimable value.

And while I am speaking on that subject, although it is digressing a bit, I might state that the owners of these cattle to-day consider that they have been ill-treated on every side. They were held up at the Union Stock Yards at Chicago, and the most extortionate and extraordinary bills rendered,—$40 a day for hay, so much apiece for each stall occupied, and at the end of about two months the bill presented by the Union Stock Yards & Transit Company was $40,000,

and they were asked to promptly settle. They did settle. They settled under protest. Now, the question arises why didn't the state or federal government start in after these cattle and slaughter them? If they had considered the conditions existing,—the feeling existing—they certainly would have to pay well for those animals. And now what is the state of things? Why, these dairy people aren't recompensed,—haven't been recompensed. Should they not, in fairness, I ask, be recompensed for what they have lost? What have they done? Merely carried the cattle through quarantine—not a self-imposed quarantine probably but a compulsory one. But they have paid their bills, and their bills amount to about $200,000. Is it fair, I ask, for the federal government to send men to value these cattle to find out whether they are worth that amount, and then these men value those cattle at meat value? A number of the calves sold for $2000 or $3000 and awaiting delivery, and still they are only worth, in the opinion of these men sent by the government, what ordinary veal is worth. Just imagine that! Jersey cattle, four weeks old, worth say $10 and $15 a head, when the owner can, or could, dispose of one of those animals for $1000. Numbers and numbers of such instances are on record, but I have digressed. I wanted only to throw a little side light on the existing conditions for the information of you veterinarians. These people should not be exasperated. They should not be irritated because they repesent a great combination of interest, the great dairy interest, and they are of extraordinary power in this country, and if something is not done—and there is no secret about this—I pity the organization known as the Bureau of Animal Industry. That is exactly the sentiment that prevails and exists to-day as I know it. So that we veterinarians who have or can in some way modify and make light the burden of these people, ought to do it, because numbers of them are almost financially ruined. Some of them have gone broke and have sold the cattle, or allowed them to go for bills which piled up against them. If something is not done—well, I would hate to think of the consequences because I know a thing or two.

Now in regard to slaughter: I will say again, I strongly endorse the position taken by the Bureau of Animal Industry in the matter of slaughter. It is the only way to control this disease. In Illinois to-day we have or are having fresh outbreaks—numbers of them. Dr. Mohler is, of course, conversant with the progress of the disease. I merely have my knowledge from the Chicago papers as they arrive, but they are not by any means getting this under control, and I would have liked to have heard Dr. Mohler deal a little more especially with the subject of the distribution of cholera serum, because we know that here has been the most glaringly bungling affair. This last outbreak in Illinois was caused by the distribution of serum that never should have gotten out. I know something about this too. I know the true history of the entire

matter most thoroughly. I venture to say there is not half a dozen men who probably know as much about this latter outbreak, but we will pass that over.

A number of interesting features developed in connection with my relationship with this dairy herd.

One thing I might state is that when I commenced to study this disease I saw a disease that was of a mixed character; a disease probably closely simulating measles, simulating small pox, simulating typhus. I don't know that the symptoms of the latter were just as marked, but it occurred to me steadily: am I attempting to carry through a bunch of cattle which, when they have run through the course of this disease, will disseminate it? That was incessantly dinned into my ears from all sources. Will the cattle on recovery still be carriers? So that I made a very exhaustive study of this question, from a comparative standpoint. I am not enough of a scientist—even though I were I might not make any progress—but as a man of common sense, one who probably can take a view as intelligent as the average—I could not see how I would have cattle that would be dangerous. Besides I commenced to check over in my mind the history of the outbreak that I had seen in my early life, and I reached the conclusion that no subsequent outbreak that had occurred to my knowledge was due to the cattle that had recovered. So I eliminated from my mind that question. At the same time it was dinned so steadily and constantly into my ears and into my mind that cattle which have this disease are liable to be carriers, and not only that but they are liable to contract the disease again, that it kept me in a constant state of hot water. What is my belief to-day? That cattle which get this disease and recover are immune. I don't believe that any man in this room could infect these dairy show cattle with the virus of foot-and-mouth disease. I don't believe that on the date we left the quarantine at the Union Stock Yards in Chicago—we were quarantined on the first of November and we left the Union Stock Yards on the 12th of December after quarantine—that we carried any disease with us. I expressed that belief at the time. I have expressed it many times since. I am expressing it to-day. I still firmly believe it. That such is the case was proven at the outset by the test that was conducted, and there never was a more gruelling test. I don't believe any animal was ever subjected to such a gruelling test as these animals were before they were released by the Bureau of Animal Industry. Now, gentlemen, these cattle have gone to their respective homes, with one exception and these cattle are commingling and have for months commingled with the cattle that remained on the farms and with the hogs that remained on the farms, and there is no outbreak of the foot-and-mouth disease on these farms. Of course, that is a kind of satisfaction to me. I realize that my association with this bunch of cattle would either

frightfully discredit me, or at least, not allow me to escape criticism. Well, the criticism, I am thankful to say, has been mild. It has not brought me any particular credit, however. I set out to allow these cattle to get well. I maintained a strict quarantine. Did I treat them with any medicine of any kind? No, I did not. They did not need it. I might say, though, I did in some instances treat a few, in this way: The bulls weighing 2500, 2600 and 2800 lbs. were so lame they could not stand up or walk. Why? Their feet were swollen. There was not merely the little vesicle we see between the digits that is indicative of the foot-and-mouth disease, but there was a general swelling and when the swelling receded the flesh receded, especially at the soles, the consequence was that the dry horn had to be removed, but this is inconsequential. In the cases of many of these animals, probably thirty bulls, I had to go down several times and treat their feet, but these thirty bulls are just as sound as ever. There is not a single instance where anything went wrong except one, and that was the animal that got the necrotic infection between the digits. To-day that bull is in good condition, and his foot is not in any way destroyed although we expected to lose him.

I hold that the virus of foot-and-mouth disease is a very benign one, notwithstanding we hear stories of the frightful malignancy of the disease. It is malignant probably if it is treated. You gentlemen, many of you are practitioners, and probably you can take a different view of the handling of infectious diseases from that taken by the strict scientists here in this body. You know as well as I do that we have numbers of infectious diseases, which, if you attempt to treat them, will prove very difficult, but if you cause them to run the regular course will do very well, and if your treatment is anything, it should be of the most simple character conceivable. Take a common case of strangles, for instance. I can take a case of strangles and I can cause it to develop and take such an irregular course just through using certain medicinal agents, that I lose the case. But if I let it alone, it will get along very nicely.

DR. KNOWLES: I might say in reference to the foot-and-mouth disease outbreak in Montana, that as Dr. Mohler has stated, it was introduced by a trainload of cattle taken in there, and that is a very good illustration of how foot-and-mouth disease can be handled by the observation of thorough sanitary and quarantine regulations, and full co-operation of owners and veterinarians with the sanitary officials. In the Montana outbreak there were some 1200 head of cattle, horses and mlues, and some hogs; also some sheep. The exact number I do not remember, but there were no new infections except the few cattle on the range that Dr. Mohler speaks of, and the stock-men were as one in co-operating with the state and government officials in stamping out the disease, realizing, owing to

the magnitude of the range country and the enormous value of livestock in Montana, that the loss would be inestimable if the disease once got a hold. But by strict observance of the sanitary and police laws, the disease was eradicated within a very short time, and Montana has been a free state and is to-day.

DR. EICHHORN: I just want to make a few remarks in reply to Dr. Hughes, as far as carriers and immunity is concerned relative to the disease. According to Dr. Hughes's observation in one single case, he claims that carriers do not exist in that disease, and also that the immunity is an established fact. Now I don't know how far Dr. Hughes's experience goes in foot-and-mouth disease, but he stated that his experience is chiefly based on the observations of the dairy show cattle. From the literature which I followed very carefully, there is no doubt that we have to contend with carriers in this disease. This is an acknowledged fact by the greater scientists all over the country where the disease is prevalent. This has been proven by such men as Loeffler, Zschokke of Switzerland and Neverman of Germany. A great many others also have stated that. They have gone further and established how the virus is carried by some of the animals. That vesicles may many times appear in the horn or the foot or inside of the horny capsule, and unless the virus is eliminated from these vesicles, it may remain in fissures and come to the surface by the natural growth of the horn. When the virus comes to the surface it starts the disease again.

Now as to immunity from the disease: of course, everybody who has ever had anything to do with this disease knows it to be an established fact, not by observation but by scientific proof, that immunity exists in these animals, but it is of relatively short duration, and the duration varies considerably in the different cases. Most of the observations have proven that immunity in animals is of a year's duration or even longer, but there are cases on record —authentic cases—where immunity did not last more than a month, and even cases where it did not last longer than two weeks. I think the data collected in the outbreak of 1902 and 1903 proves satisfactorily that re-infections have occurred within a very short time.

I think it is really superfluous to go into a discussion of this because I believe the teachings in regard to foot-and-mouth disease by men who are acquainted with the progress of the work and study of this disease should familiarize the student with the facts as to what extent carriers may become dangerous in the control of the disease, and also what part immunity plays.

DR. HUGHES: I have intimated that there are few of you who have been around the disease more than I have, and few have read upon this subject of foot-and-mouth disease more than I have. Not that I am a linguist, or one who is educated and versed in various languages, but I have gone through considerable straits to have translations made and knowledge furnished me from varied sources.

Among the European observers there is no man, I think, who stands higher than Dr. Bang of Copenhagen. I have a supreme respect for the gentleman. I have the privilege of knowing him. Dr. Bang is a linguist, a scholar, a scientist, a practical man. I venture to say there is not a more practical man in the entire European country than Professor Bang. He is a member of the Veterinary College of Copenhagen, a school that won't take a back seat to any school in Europe. Does Bang know anything about foot-and-mouth disease? He has been in the thick of it. Denmark has been harboring this disease actively since 1869. England has harbored this disease from 1839 to 1887 without having gotten rid of it once. Surely these people must be observers. Will you permit me to read a little extract from a comparatively recent paper of Dr. Bang dealing with that subject, foot-and-mouth disease? "In no instance was it possible to determine in what way the disease was first introduced into the country,—and this was also the case with later epidemics—but there can hardly be any doubt that it came to us from Germany, which was very badly ravaged during that year." (1869). "I am inclined to connect the dying out of the disease with the introduction of a very careful system of disinfection of the railway wagons used for cattle transport, this disinfection having originally been very faulty. Later, during the next few years there occurred a few very remarkable occurrences on estates (four) which the disease had attacked six months to a year previously. At all four places all the cattle which had been born on the estate after the last attack were killed, and also all cattle subsequently added (respectively, twenty-one, four, thirty-five, and, I think, about forty head), whilst I let the greater part of the stock live,—that is to say, all the animals which had been through the disease on the previous occasion, and all these animals showed themselves to be immune." There is one instance where a practical man expresses his belief in the fact of their immunity.

"As during this period there was not a trace of the disease elsewhere in this country, and there could not have been any possibility of infection from abroad in any of the places mentioned (except through fodder, which is imported by all farms here), it must be assumed without a doubt that the infection had remained hidden on the farm from the previous attack." I think that is possible, but the carrier business, I don't take any stock in. Think of a small pox patient being a carrier two or three years later, or a patient being a carrier of the measles a year afterward! That is a surface trouble; that is not a typhoid condition. "All the houses therefore were subjected to a very thorough disinfection, and, especially at Brorupgaard. I remember that some rather expensive improvements were carried out in the woodwork of the buildings. Nevertheless strangely enough, the disease returned a third time on this farm, on March 2, 1895, that is to say, over a year later. On

this occasion all animals introduced to or born on the farm since the previous outbreak were also killed immediately, making seventy-seven head of cattle in all, whilst I allowed all animals which had previously had the disease to live. They all proved to be immune, even those which had had the disease two years previously. The only possible explanation seemed to be, according to the farm people, that shortly before the appearance of the disease, the cattle had been fed on hay which had been lying in the loft over the cow-house since the previous outbreak. This hay was, of course, burnt, together with any other fodder which might possibly be thought to have been infected through the boots or clothes of the cow-man, and a large sum of money was also spent on rebuilding the cow-house, from which all wood-work was removed and replaced by iron, stone and cement. Since then the disease has not re-appeared on this estate."

I don't want to detain you gentlemen, but I could read to you a little further on where Bang comes out in an absolute flat-footed fashion and endeavors to controvert the notion that immunity does not exist for from one to seven years. He says it is rather indefinite, but that it may be permanent. In fact, he says: "I firmly believe that immunity is the rule."

DR. EICHHORN: I believe myself that immunity of a year or longer duration is the rule, but there are exceptions, and there are quite a number of them stated. Now as far as the carrier is concerned, my previous statement was not based on the instance of just one or two cases, but the last official publication of the German, or rather British government, showed that they made the utmost efforts through their official veterinarians to determine to what extent carriers are responsible for foot-and-mouth disease in Germany. They instructed their men to make the most careful observation and follow each individual outbreak from its origin. Not less than about a hundred cases are cited with the location, the number of animals affected, and all the details, in which they could not trace the disease to any other source than to carriers. Now I think such extensive statistics must be given consideration.

DR. HUGHES: I would state, Mr. Chairman and gentlemen, that Bang, having reviewed the literature of the world on this subject, has reached the conclusion that immunity is the rule. There is only one single case that I can find,—one single instance in which this disease was disseminated through a carrier, and that was through a bull that was shipped to Northern Sweden and a crack was discovered in his foot. It was supposed that the virus filtered into the crack and that it remained concealed for a considerable period.

As far as observations of students in Germany go, I don't take any stock in it. In reading the literature I find that the German policy is to put into the field the young men—they won't let

the old practitioners do the work. Why? Because they disseminated heresy, so they send their youngsters down to make observations. Now if there is an irresponsible, it is a recent graduate.

DR. FROTHINGHAM: Mr. President: I would be very much obliged if Dr. Hughes would leave with us this reference of Dr. Bang—where it is published.

DR. HUGHES: The paper I alluded to, is a paper presented by Professor Bang at the Royal Veterinary and Agricultural College of Copenhagen, October 16, 1911, translated from the Ugeskrift for Landmaend, Nos. 43 and 44, 1911. To which Dr. Bang has since made several emendations and additions.

DR. MURPHEY: I don't know anything about the immunity of foot-and-mouth disease, but I am thinking about the immunity of public sentiment, and there was considerable of that in Iowa. There was a law passed down there which was vetoed by the governor limiting the area of quarantine districts, and according to the newspaper accounts the two men who pushed such legislation and who stated that there was no such thing as foot-and-mouth disease were the Messrs, March and French who were exhibitors at the National Dairy Show at Chicago, and it is a matter of interest to the men in Iowa to see the psychology and viewpoint of the gentlemen.

DR. MOHLER: Personally I shall not even attempt to convince Dr. Hughes with reference to the facts all the rest of us know and which are supported by the most noted foot-and-mouth disease authorities in all countries concerning immunity and virus carriers in this disease. However, I am very glad for the sake of accuracy of statement that he somewhat qualified his remarks about Professor Bang. What Professor Bang has written on the subject of foot-and-mouth disease is open to all and no individual has a monopoly of it. I too am familiar with what Professor Bang says along this line and he very clearly states that as a rule the immunity lasts for two years. I think we all concur in that statement, but Professor Bang does not give this as the minimum length of time of the immunity in all cases. In fact, he distinctly states that while immunity is the rule, there are exceptions. In talking on the subject of foot-and-mouth disease with Professor Loeffler not many years ago he told me among many other interesting facts that he had known of cases where reinfection had occurred within the same year. Dr. David S. White, Dean of the Veterinary Department of Ohio University, stated to a committee of the United States Senate that at Vienna, Austria, he had seen one cow that had contracted foot-and-mouth disease five times in one year. Personally, I had an opportunity of witnessing the recurrence of foot-and-mouth disease in one animal that had recovered from the disease four weeks previously. Text books cite a number of similar authentic cases of this same character, showing a short duration of immunity. It is beyond controversy that these are exceptional cases, but, gentlemen,

it is these exceptional cases that the U. S. Bureau of Animal Industry is attempting to locate and eliminate. It has been the exceptional cases which have always caused trouble. They are the cases that caused the infection at Niles, Mich. They are the ones that became infected on August 8 and served to keep the foot-and-mouth disease alive in this country up to the present. Those exceptional cases which act as virus carriers have been held responsible by certain authorities for the recurrence of the disease in portions of Germany. Bang himself cites an instance where a Dutch bull having recovered from foot-and-mouth disease was taken to Sweden with the result that the disease broke out in the latter country, due to virus carried in an old fissure in the foot of the bull. Loeffler likewise gives similar instances of virus carriers, but no one thinks of these otherwise than as exceptional, unless it is Dr. Hughes who states they never occur. I am not attempting to convince Dr. Hughes on these points; I know I cannot if Bang and Loeffler cannot, but I am very glad to have the opportunity of challenging his statements and of asserting that in the eradication of this disease the exceptional cases must not be ignored.

Now, so far as contaminated hog cholera serum starting a new outbreak of foot-and-mouth disease in Illionis is concerned, we do not know enough about the infection of the different herds to draw any definite conclusions at this time. In my paper I went into the details so far as the facts would warrant. On August 8 I was called up at half past one by a telephone call from Chicago and the information came from Dr. Jenison, our inspector in charge at that place, to the effect that hog cholera serum shipped out from a certain establishment in Chicago had apparently caused infection in the large herd of hogs he had visited that afternoon. The facts which came to me over the telephone that night and which have been established beyond a doubt were that nine shipments had been made from this serum company in Chicago to eleven people who are located in six different counties in Illinois, one county in Minnesota, one in Michigan, and another in Indiana. These shipments of suspected serum were immediately traced to the respective farms and the premises quarantined. Several days later infection was found on these farms in four counties in Illinois. The vaccinated hogs in Saginaw County, Michigan, never did contract the disease because of the prompt action of the men on the Live Stock Sanitary Board and Dr. Dunphy. The animals were destroyed and buried four days after they had been vaccinated without having contracted the disease and a similar method of disposing of the animals was followed with the still healthy vaccinated herds in Ford and Henry Counties, Illinois. The Governor of Indiana was asked to take similar action with the vaccinated hogs in Posey County, but he apparently was hopeful that the herd would remain healthy. A few days after taking the matter up with the Governor the animals came

down with foot-and-mouth disease. They were destroyed and the premises disinfected in the usual manner.

You will note that eight out of eleven herds which received this particular serum became infected with foot-and-mouth disease. Strange as it may seem, we have not thus far obtained positive results from laboratory experiments with this serum. If I see the results in the field giving positive evidence of infection, such evidence is more substantial than one thousand negative diagnoses in the laboratory.

The serum which is suspected of having caused the infection was made on October 29 last at a time when there was not the least suspicion that the serum plant in Chicago was infected. The amount of serum in this batch was 41,000 c.c.'s. A test of it for potency and for foot-and-mouth virus was made in the customary manner by the inspector of the Bureau of Animal Industry who has charge of the serum plants in Chicago, and after waiting a certain period of time without anything objectionable developing in the test animals, permission was given to the firm to dispose of this material. The ten hogs which were used in the test, two of which received as much as 40 c.c.'s each, were subsequently taken to a farm four or five miles out of Chicago and to-day are alive and healthy, as are all the other hogs and cattle belonging to the farmer and which have been daily exposed to the original hogs that were used in the test of the Chicago serum. When this new outbreak occurred in these different herds as a result of what we may assume to be the contaminated serum, we collected samples of the left-over serum from the infected farm, had them forwarded under seal to Washington, and Dr. Eichhorn took the material out to the experiment station, inoculating three calves and twelve hogs intravenously and subcutaneously. As a result of these inoculations there have been absolutely no indication that the serum, which was collected in the field by men sent out to investigate the outbreak in these recent cases of suspected hog cholera serum infection, caused the infection. In no case has any of those fifteen animals developed foot-and-mouth disease.

There is only one possible explanation I can make, and that is, that the field vaccinations were made in large herds, consisting of from 34 to over 200 animals, and only one or two animals in these herds at first contracted the disease. These evidently were very susceptible animals and they alone contracted the disease at the beginning. In order for us to reproduce these field conditions it will be necessary to continue the inoculations on a much larger number of animals in order that we may find an animal sufficiently susceptible to come down with the disease if the serum is contaminated, since the virus must evidently be in a weakened condition from contact for nine months with one-half of one per cent carbolic acid with which all serum is preserved.

Dr. Hughes has referred to the appraisement of the dairy show herd. Two of the three men who were selected by the department to appraise these animals were unknown to me before they became appraisers for the government. I knew only one of these gentlemen. That man I have no reason in the world to apologize for. I refer to Dr. Sigler of Indiana, one of the finest men who ever breathed the breath of life. He is a member of this association and I stand sponsor for him, because I have known his worth for a long time before he became an appraiser. One of the other two appraisers has been the official appraiser for the state of Michigan during the outbreak in that state, while Dr. Sigler had held a similar position for Indiana, both having given excellent service and entire satisfaction to all sides before appraising the dairy show cattle. If Dr. Sigler does not know the value of an animal, I am very much surprised. Born and raised on the farm and owning a large farm himself, he knows the values of farm animals. He appraised the show animals according to his interpretation of the law as passed by Congress. He was not affected or influenced, nor were either of the other two, by any official or other person. They merely read the law and placed their honest interpretation on what they considered to be the intent of Congress.

STUDIES TO DIAGNOSE A FATAL DISEASE OF CATTLE IN THE MOUNTAINOUS REGIONS OF CALIFORNIA*

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In 1913, Dr. Charles Keane, the State Veterinarian of California, asked the writer's co-operation in establishing the diagnosis of a fatal disease particularly prevalent in Sierraville, California.

From the description given, the malady corresponded in many respects with bovine hemorrhagic septicemia. No bacteriological evidence had, up to that date, been collected, the diagnosis having been simply anatomical. The experience which the writer had had in Pennsylvania in establishing conclusively the tentative diagnosis of hemorrhagic septicemia, which had been suggested by the late Leonard Pearson, made the problem, so generously offered, a very attractive one.

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In 1913 two specimens from Siskiyou County were received in such a condition that a careful bacteriological examination, which was attempted, failed completely; only contaminating organisms of the cocci and coli groups were isolated.

In 1914 our attempts were more successful, and I was fortunate in autopsying one case of the disease in California and three cases in Nevada where, according to Dr. W. B. Mack, a disorder which is in many cases similar, if not identical, to the one in California, is causing severe losses in Carson and Sierra Valley.

Dr. J. P. Iverson, Deputy State Veterinarian of California, has, in a gratifying and untiring manner, autopsied a large number of animals and forwarded to me a number of specimens and cultures for laboratory study. Thus far, about ten different specimens from California have been examined. The conclusions which can be drawn from this material are instructive in many respects, and I select this opportunity to present the same, not because they are in any way final, but because they will stimulate discussion and will encourage work along the same lines.

1. SYMPTOMATOLOGY OF THE DISEASE: It is difficult to observe diseased animals because the incipient symptoms are not very pronounced and they succumb to the disease in a very short time. In some cases, however, the most prominent symptom observed was the passage of blood-tinged urine which apparently contained even clotted blood. Liquid feces, with marked bile stain or coagulated blood, were passed. In some cases a hemorrhagic diarrhoea was very marked. In some retarded cases the feces were very hard, dark colored, and formed, covered with adherent mucus. The temperature in some of the cases which I observed was above normal, but not above 105 degrees. The respirations were rapid and markedly abdominal; the general behavior, depressed; the skin and hair, rough. In one case a local swelling on the metacarpal joint, with impaired locomotion, was noted.

The cattle are very frequently found dead without having shown any alarming symptoms. According to the stockmen, the animals will die in from three to four hours following the passing of blood-tinged urine.

I have the impression that the clinical diagnosis is impossible and I have, therefore, concentrated my efforts on the post mortem findings which, however, were not conclusive.

2. ANATOMICAL FINDINGS: There was a marked icterus; num-

erous petechiae and hemorrhages were found in the subcutis. In some cases there was pronounced localized hemorrhagic edemas and exudation with enlargement of the subcutaneous lymph nodes.

The abdominal cavity contained either a small amount of yellowish fluid, or a large amount of well clotted blood. The omentum, peritoneal lining and mesentery were well mottled with hemorrhages, and diffused areas of inhibition surrounded the larger blood vessels. The most prominent lesions were either in the duodenal loop and the adjacent portions of the liver, or in the liver alone. The wall of the duodenum was thickened, jelly-like and dark reddish, frequently covered with fresh fibrin meshes and adherent to the liver; the contents were bile stained; the mucous membrane was slightly swollen and showed fine hemorrhages.

In the jejunum and colon there was either liquid, dark blood-like material, or bile stained, slimy chymus, or dry, adherent, sticky contents. The regional lymph nodes were enlarged, soft and in some portions hemorrhagic. The mucous membrane of the abomasum showed occasionally petechiae and a few erosions, or was also involved in the inflammatory reaction of the duodenum.

The liver was always enlarged, of a peculiar light-yellowish color and soft in consistence. In the middle and Spiegel's lobe there was a large, saffron-yellowish, irregularly shaped area, friable and well defined, which on section imposed as a very large hemorrhagic infarct. The anemic necrotic tissue showed very distinctly several thrombosed blood vessels, mostly veins, occasionally arteries. The serous membrane of the gall bladder was also infiltrated and affected by the inflammatory reaction caused by the infarct. The portal lymph nodes were soft, enlarged and imbedded in a gelatinous mass. The presence of these hemorrhagic infarcts was recorded in every case of which I obtained material in 1914. Also, in specimens quite recently collected, in 1915, the infarct was present. The autopsies in Sierra and Siskiyou counties correspond therein, in every respect.

Two cases autopsied by the writer in Nevada had similar lesions in the liver, but the process had, apparently, further advanced. In a two-year-old steer a large abscess was found in the middle of the liver. It would have been explained on the basis of a foreign body perforation, were it not that a second autopsy of a steer, which was killed and autopsied on the same day, offered a better interpretation of the process. In the latter animal a fibrous

inflammation of the diaphragm, which had also incited by continuation a similar inflammation in the right pleural cavity, covered a typical yellowish hemorrhagic infarct. The abscess in the first animal was, therefore, only the result of infarction and a prominent sign of the etiological identity of the processes.

This striking occurrence of the liver infarcts in the different localities has, in my judgment, a considerable bearing on the diagnosis.

The spleen was, in most of the cases, small; perhaps in some portions slightly enlarged and soft. On the capsule a few small or large hemorrhages were noted. The kidneys were dark brownish, spotted with punctiform hemorrhages, and in the medullary portion were diffusely reddish and streaked. The urine was always dark brownish and blood-tinged. The degree of hemaglobinuria varied with the different cases.

In the thoracic cavity a small amount of fluid was found in both pleural sacs. The pleura was smooth and stained with hemorrhages of varying sizes. In the lung parenchyma, small infarcts or diffuse lobular and lobar hepatization were noted. In a few cases, extensive inflammatory processes along the trachea, larynx and pharynx were recorded. The regional lymph nodes were correspondingly involved and hemorrhagic. The heart contained always well coagulated blood. The epi- and endo-card showed petechiae, suggilations and hemorrhagic extravasations; the myocard was turbid, flabby and soft.

Judging from the constancy of occurrence of the lesions, the etiological factor was predilective for the liver, lung, serous and mucous membranes.

Involuntarily I recalled the postmortem findings of cases of hemorrhagic septicemia autopsied in Pennsylvania, and I expected to be able to prove, bacteriologically, in a very short time, the etiology of the above mentioned lesions. My late assisstant, Dr. Crocker, and myself pointed ont, in 1912, that the descriptions of the postmortem findings as given in text-books are incomplete; namely: in acute cases an apparent localization and filtration of the *Bacillus bovisepticus* takes place through the blood vessel system of the lung and liver. In such cases the bacterium is never found in the blood, but always in the infarcts and can from there be easily isolated in pure culture.

The extensive bacteriological examinations which were con-

ducted with the material of about twelve cases (ten California cases) did not reveal such conclusive results and therefore need more detailed discussion.

3. BACTERIOLOGICAL EXAMINATION: The pieces of organs were wrapped in cloth or muslin soaked in a weak bichloride solution, placed in Mason jars and forwarded on ice to the laboratory. In about eight cases, glucose broth was inoculated with blood material from the liver, lung or spleen. In most cases the cultures revealed the same organisms obtained otherwise, or they were found to be sterile (particularly the blood).

The microscopic study of the tissues did not reveal, in any case, bipolar organisms which could be diagnosed as *B. bovisepticus* without further isolation. Leishman or Giemsa stain was uniformly used for the demonstration. In the liver infarcts, spore bearing, Gram positive rods were found in every case, frequently associated with diplococci resembling pneumococci.

The ordinary culture methods gave no satisfactory answer as to the bacterial flora in the liver, lung infarcts and lymph nodes. Pieces of tissue immersed in glucose broth gave rise usually to the growth of anaerobes or intestinal organisms, some of them staining bipolar, as everyone knows. We immediately used, therefore, the primary animal inoculation as a means of isolating the various organisms seen microscopically; experience had also taught us that the presence of the *B. bovisepticus*, when rare, is revealed only by their pathogenicity for rabbits or mice.

Always one or two rabbits, guinea pigs and mice were inoculated with emulsions (1:2) of the liver infarcts, lymph nodes and spleen material. In this manner we obtained, from about twenty-five rabbits inoculated, two animals which had died from a typical bipolar infection. The material used on these animals came from a two-year-old heifer and a seven-month's-old calf. In the first case, an emulsion of the hemorrhagic mesentery and, in the second case, lymph node material had been inoculated subcutaneously. The two rabbits succumbed to the infection in seven and five days, respectively. The bipolar organisms were found in the *purulent fibrous exudate* of the peritoneum and the heartblood. Subsequent identification showed the comparatively low virulence of the isolated organisms for rabbits, which explains the long course of the disease following the inoculation and other points to which I shall refer later. The *B. bipolaris* isolated from these rabbits gives all the

cultural identity reactions recognized as typical for the *B. bovisepticus*. Also the pathogenicity tests are characteristic, with the exception that, generally, large doses are required to cause a fatal result in laboratory animals. It is also pathogenic for calves by intravenous inoculation. Death resulted in a three-weeks'-old calf following the injection of 3cc. of a 20-hour'-old broth culture of strain 22 (calf strain) in 22 hours. The two strains are identical and serologically protect against each other and also against *B. bipolaris septicus* strains which were obtained from varied sources in the United States.

The animals similarly inoculated with the same material, or with the organs of ten other cases, remained alive, or succumbed to various other infections which are particularly valuable because they weaken the above recorded positive findings of bipolar organisms in various respects.

(1) All the guinea pigs inoculated with the liver infarct material died from infections with anaerobes associated with *B. coli* and diplococci. The anaerobes resemble the *B. chauvei*, microscopically, because on the serous membranes of the infected animals they form only aggregations of pairs. Culturally and serologically they are, however, a type of pseudo malignant edema bacilli, which have not as yet been described and need further extensive study to be classified. These organisms are present in every case and in every infarct and, when the cadaver is not fresh, they are found in every organ. They were isolated from the California and the Nevada cases and they were, before death, in the diseased livers, because material removed immediately after death, in two calves, contained only these anaerobes in the liver infarcts. The organism is *not* pathogenic by subcutaneous application to calves, and is probably a secondary invader from the intestinal tract.

In our experience in Pennsylvania these anaerobes were also present, but less prominently, and in every instance the *B. bovisepticus* was also isolated without the slightest difficulty. We have thus far failed to repeat the condition in California.

2. Some rabbits succumbed to infections with the *B. necrophorus*, probably due to contamination of the material. I may mention here that the anaerobic bacillus isolated from the infarcts is causing local necrosis and abscess formation, but never septicemia, in rabbits.

3. The guinea pigs which succumbed to the infection with

anaerobes frequently showed, in the blood and exudate, a diplococcus with a marked capsule indistinguishable from pneumococcus. The same organisms were found in some blood and liver cultures sent from three cases of the cattle disease, in the muscle smears of blackleg cases autopsied in the same localities, and in the pus from the two Nevada cases referred to above.

In our experience these organisms are secondary associates with numerous anaerobic organisms. Biologically they are closely related to the pneumococci. With pure cultures one produces on intravenous inoculation in calves a fatal septicemia, in rabbits local necrosis and septicemia, in guinea pigs necrosis and sepsis, and in mice local edema and septicemia. For the first two animals, large doses have to be used to produce speticemia.

These bacteria are doubtless not responsible for the cattle disease, but have some importance as secondary invaders. In some cases of typical blackleg the same organisms have been found and therefore they do not need further consideration.

4. Most of the mice inoculated with lymph node, liver or spleen material, remained alive, or succumbed to the same anaerobic organisms as did the guinea pigs. The mice inoculated with the same material, which caused a *B. bovisepticus* septicemia, were sick for several days, but recovered; they were not immune to a subsequent injection with bipolar organisms.

As stated in detail, in two out of twelve cases carefully tested, the primary animal inoculation furnished evidence which would support the anatomical diagnosis of hemorrhagic septicemia. The bacteriological study of the two strains (Strains 10 and 22) suggests the view that the organisms were either present in small numbers only, or that they are exceedingly low in virulence for the laboratory animals. Our experience with hemorrhagic septicemia supports both conceptions and again brings forward the fact that the bacteriological diagnosis of hemorrhagic septicemia is not as easy a procedure as is generally considered. We read everywhere, and have doubtless also been taught, that the *B. bovisepticus* is very pathogenic for rabbits. Numerous investigators have shown that bipolar organisms can also be found in healthy animals, and that they frequently localize themselves in tissues and take part actively in pathological processes originated by quite different groups of organisms. The careful bacteriologist realizes that the diagnostic demonstration of bipolar organisms is considered limited for these

reasons. On the other hand, we know that in advanced pathological lesions caused by bipolar organisms, particularly when necrosis is present, the bacteria are very rare or entirely absent, a condition which is well illustrated by the liver lesions in some of the cases which I have seen. The very small percentage of cases (Cases I and VI) in which bipolar organisms were isolated, is difficult to explain. Low virulence or localization of the organisms in organs which have not been tested, has to be considered; the question can only be settled by further experiments.

I feel that the bacteriological evidence thus far collected is by no means sufficient to make a conclusive diagnosis of hemorrhagic speticemia.

5. EPIDEMIOLOGY OF THE CATTLE DISEASE: The disease makes its appearance usually at the beginning of July. Sporadic cases occur until the beginning of January. Even after the animals have been removed from the pasture, fatal cases are noted in the stable. During some weeks the extent of the disease is enzootic. Two or three dead animals are found on the ranch on the same day. So far, outbreaks on high, swampy mountain pastures only, have attracted our attention. Age and sex apparently have no influence on the epidemiology. In the same localities anthrax and blackleg exist endemically but the entire livestock is prophylactically immunized against these two diseases and there is no doubt in my mind but that the evidence thus far collected eliminates these two diseases.

The telluric and climatic conditions in the Sierra Valley are similar to those commonly found in localities where hemorrhagic septicemia is endemic. A careful survey by Dr. Iverson failed to demonstrate any plants which could be responsible for the death of the animals. The question of insects and their seasonal prevalence as having anything to do with the cattle disease, has not as yet been thoroughly investigated but will be undertaken at the first possible opportunity.

EPICRISIS: In the foregoing paragraphs I have attempted to describe the facts which have been personally collected during the study of a destructive cattle disease in California. The experimental records will be published elsewhere, but I feel that an analysis of the inclusive findings is warranted because the animal losses are heavy. Some means should be adopted whereby the stockmen can keep animals on the notoriously dangerous territories, as well as to relieve their already heavy burdens.

Throughout the recital of facts, I have assumed an attitude which will give the reader the impression that I am of the opinion that the disease is an acute form of hemorrhagic septicemia. The anatomical lesions are certainly of such a nature that everyone familiar with the interpretation of lesions would feel that the diagnosis "hemorrhagic septicemia" is logical. Furthermore, the bacteriological results would be confirmatory, in two cases at least, for the unscrupulous laboratory worker. One has to remember, however, that in many different diseases bipolar organisms or Pasteurella have been isolated, which in the recent and more critical years of bacteriological knowledge have been recognized as being due to protozoa or filterable viruses. I do not imply herewith that I thing the cattle disease is due to protozoa, because a search along these lines has been made and has been negative. In considering these conditions a certain degree of reserve is doubtless appropriate.

The striking liver lesions are the result of a blood infection; the blood vessel lesions with thrombosis can be followed along the branches of the hepatic arteries, portal and hepatic veins. The lung and kidney lesions have a similar origin; the entire inflammatory reaction on the duodenum follows the primary focus in the liver. The epidemiology and the telluric conditions all strongly point in the direction of hemorrhagic septicemia.

As a working hypothesis, without extending myself further critically, I have assumed that the disease this year is, in all probability, hemorrhagic septicemia. A broad, harmless experiment in immunizing about one-half of the livestock at Sierraville with a special *B. bovisepticus* vaccine, using the other half as a control, will perhaps satisfactorily settle the question and establish the long denied diagnosis.

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ABSTRACT OF DISCUSSION.

DR. DUNPHY: Mr. Chairman: I have listened with a great deal of interest to Dr. Meyer's paper for the simple reason that we are confronted with a similar condition in my own state. We have a very similar disease among us which has caused considerable mortality, and so far has baffled our efforts to determine what it is. A postmortem revealed a true picture of hemorrhagic septicemia, but our laboratory experiments have not confirmed it. We find on laboratory experiments on guinea pigs we can kill the first pig. The first pig inoculated from the diseased animal will usually die, and

from that on, the material seems to be absolutely non-pathogenic. We have taken the blood of some of those guinea pigs which have died and injected it in calves without any effect whatever. We have done the same thing on other guinea pigs, but in all cases that we have tried, we have found after the first animal infected, that the material becomes non-pathogenic, although the postmortem appearances show almost a true picture of hemorrhagic septicemia and correspond closely with the conditions described by Dr. Meyer. So far we have been unable to establish the fact that it is hemorrhagic septicemia. We have had an unusual season in Michigan this year. It has been very wet. We find the animals affected are on wild pasture, usually low land, and for that reason we have had a botanist examine one of the pastures. He spent a number of days there. He located a few poisonous weeds, such as wild parsley and water hemlock, but I am under the impression that the animals could not have received a sufficient amount of this weed to produce death, or even pathological symptoms. We have gone further: as a number of the parties who had animals die on their premises were under the impression that the disease was contagious on infectious, I took two of these animals—the only two I found before they were dead—one having a temperature of about 106 and the other of 104½, (and our experience was that as a rule they did not live more than from eight to twenty hours after they were first noticed as being sick), and tried some experiments. I took an animal from a high pasture that had not been exposed to the same conditions and shut him up in a box-stall with these two sick animals until they died. I kept him confined there about twenty-four hours after the animals died, then removed the carcasses and buried them with lime and left him in the stable. He came away about the 15th day, and that animal is still alive and well. Of course, this is only one experiment, but I am inclined to believe that the disease is non-infections and non-contagious, and it corresponds so closely with the postmortem lesions that Dr. Meyer describes as to lead me to believe that we have the same conditions in Michigan.

DR. KINSLEY: I have also been interested in Dr. Meyer's description and in Dr. Dunphy's. In the state of Missori for some four years we have been having considerable difficulty with especially young animals shipped from our public stock yards for feeding and grazing purposes. It is not uncommon in September, October, November, and in fact, until the following May, to have reports of nearly every carload of cattle that goes through the yards, as being affected with what is ordinarials termed "infectious pneumonia". About four years ago I was asked by the state department to investigate this, and in four different herds on one trip I found a pneumonia of croupous type in which there was a marked interstitial exudate simulating in a way the picture of the lung from an ox affected with contagious pleuro-pneumonia, but the interstitial

serum was not the sort we find in that disease. In addition, we found pleurisy, associated with more or less hemorrhage of the serous membranes, and particularly of the epi- and endo-cardium. Sometimes we find the abdominal organs hemorrhagic. Usually if the animal lived three days or over after the infection, there is found a nephritis. If the animals have died soon after the infection is established, as they sometimes do in six or eight hours, we don't find nephritis. I have examined many of these specimens and in the first examinations I failed to isolate any organism except an organism that was evidently a contamination, but I found by taking my culture tubes to the carcass, making the cultures direct from the lung lesions, especially pneumonic centers, I have had no difficulty in practically every case in isolating a bi-polar staining organism that quite promptly kills rabbits, and from the culture appearance and clinical manifestations, and all, we have called the condition hemorrhagic septicemia of the pectoral type.

We have had many cases of it. I recall one special instance in which there was some 120 three-year-old steers shipped from the St. Louis yards to central Missouri. Of this bunch, on the third day after shipping sixteen died, with several others sick. I think in all some forty head out of the 120 died. We have in other instances as high as a 50% loss, and usually that is of animals younger than these I mention—that is all yearlings, two-year-olds, and calves.

Following out the suggestion that was demonstrated by the Bureau of Animal Industry after the Yellowstone Park outbreak of hemorrhagic septicemia in buffalo, the state department asked me to attempt the preparation of a vaccine by the use of organisms isolated from various outbreaks in our state. This has been done, and whether it is a coincidence or not, I am not ready to say, for we are still in the preliminary work, only having carried on this work some two years and I do not feel like making positive statements, but all of the animals that have been immunized before shipping from the yards have not developed this disease. While others shipped the same day to the same communities, the same country stock yards, have had this disease develop and destroy anywhere from one to five or six per cent, and even as high as twenty per cent. And further, we have found, although that may also be a coincidence that by the injection of this material into the healthy animals in the herds in which we find these infected animals, there are practically no others which become infected. In other words, the disease ceased.

Now, this may all be a coincidence. I am not ready to make any positive statements, but I have been interested in this discussion because it is, or I believe it to be this same disease, with the one exception in the lesions. We have noted some liver lesions, but they are not at all constant. The principal lesions we find consist

of the pneumonic pleurisy, and if the animals lived long enough, so that there is a toxin, we find also a nephritis. I have found some instances in which there were liver lesions.

I would like to ask Dr. Meyer one question of the necro-bacillus; if I remember correctly, he said treatment with potassium iodide relieved this condition. Was it this particular condition?

DR. MEYER: It was this particular condition.

DR. EICHHORN: I was especially interested in the statement of Dr. Kinsley relative to his success in the bacterin treatment of the condition he has described. I am sorry I have not seen the publication of it.

DR. KINSLEY: It will come out in the Missouri reports. It was prepared about a month ago.

DR. EICHHORN: I was interested in the statements in regard to treatment of the disease. The first time we had occasion to apply it, as Dr. Kinsley mentioned, was an outbreak among the buffalo of Yellowstone National Park in 1911. A number of calves died from a mysterious disease and the local veterinarian who was sent there to investigate did not make a definite diagnosis but forwarded some material to Washington. We isolated the hemorrhagic septicemia organism, and as they had begged us to give them assistance in coping with this disease, a vaccine was prepared and forwarded there for the inoculation of the entire herd. Whether it was a coincidence, as Dr. Kinsley states, or whether it had real merits I am not able to say, but after the administration of the vaccine, not a single animal died. The results were so gratifying to the management of that herd that they requested us to prepare for them annually a vaccine from the same strain of organism, which we have been doing, and they have vaccinated the herds for the last four years, and they have not lost a single animal from that herd.

As to the disease Dr. Meyer describes in his paper, I think it is very interesting, and apparently from the discussion of Dr. Dunphy they have the same disease in Michigan. The feature which strikes me as particularly interesting, is that the organism does not appear to have the pathogenicity as in the various outbreaks of hemorrhagic septicemia. It would certainly be interesting to know whether vaccination against the disease would prove effective. I would like to ask Dr. Meyer whether he experimented with the administration of vaccine from the organisms he isolated, and what success he had with the same.

DR. SIMMS: Mr. Chairman, in the absence of Dr. Lytle, the state veterinarian of Oregon, I would like to say we have, apparently, the same disease in Oregon. I have not had a chance to make any microscopic or bacteriological examination, but the disease occurred in the mountainous section of the state where the cattle had

been upon swampy, miasmatic pastures in those sections, and it is certainly similar to the disease which Dr. Meyer describes.

DR. MEYER: I am certainly indebted to Dr. Dunphy for having mentioned that a disease similar to hemorrhagic septicemia exists also in Michigan. With regard to the pathogenicity of the organism to be isolated from such cases, I only want to recall the facts which have been brought out by Dr. V. A. Moore many years ago, that in absolutely healthy cattle bi-polar organisms can be found which are pathogenic to laboratory animals in the usual manner. This fact suggests that the demonstration of bi-polar organisms has to be properly controlled before it is of any value for the diagnosis. I felt this way particularly in regard to the two cases mentioned in my report. We know of diseases in which bi-polar organisms, originating probably from the respiratory tract, are frequently encountered in cultures from various organs, and yet they have nothing to do with the disease.

I have seen sporadic cases among cattle and other animals in which I isolated these bi-polar organisms, but by careful investigation it was found that quite different organisms were actually responsible for the disease. You all know the changes which have taken place in the last few years concerning our knowledge of the relation of swine plague to hog cholera. We have a filterable virus as the main cause; it reduces the resistance of the lung tissues so that the saprophytic bi-polar organisms can invade it and produce what we called "swine plague pneumonia".

In pneumonia of calves, experience has taught us that bi-polar organisms can be the primary cause, and if, as Dr. Kinsley has demonstrated, the immunization is fully protecting against further occurrences, the proof of their being the etiological factor is apparently fully established. We have, however, to bear in mind that other organisms of the coli or paratyphoid groups are also responsible for pneumonia in young calves.

Further; we have to keep in mind that in many diseases of calves the primary test of infection is the intestinal tract. The subsequent weakening effect will have the same results as already cited in hog cholera. In such cases the immunization will be without results. The lesions of hemorrhagic septicemia, as we find them in postmortems, do not say anything whatsoever. The bleeding from the blood vessels, the diffuse hemorrhages, petechiae, and so on, in all the organs, prove nothing. They are only indications of the blood vessel injury which can be caused by various kinds of organisms from the toxins of the bi-polar organisms down to the filterable viruses. In hog cholera, in swamp fever, and in other diseases we have the picture of a hemorrhagic septicemia. The anatomical lesions of hemorrhagic septicemia represent only an existing condition, but do not indicate the cause of the same, and therefore are not a criterion for the diagnosis. The findings have to be sifted

bacteriologically down to the causal agent, and I am therefore as cautious and as careful as possible in making a final diagnosis, when the findings are not constant.

I would have been only too glad if you would have discussed more in detail the facts which I have presented to-day. The more we discuss these things, the more we assist each other, and reach an understanding.

With regard to the vaccination, I only want to add that I have begun in an experimental way to immunize against bi-polar infections; we have tested our vaccine, and have obtained no ill effects thus far. The experiment is in progress. I cannot say what results we will have in the field. In any case, I have no doubt that the immunization with vaccines is exceedinbly promising. In our case it will be an experiment to establish a conclusive diagnosis and to eliminate all the other diseases which have had to be considered in connection with this fatal cattle disease.

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PICTURES EXHIBITED BY DR. K. F. MEYER*

Dr. K. F. Meyers explained a series of photographs, drawings and charts collected by himself in South Africa illustrating mostly tropical diseases of animals, also a few very interesting pictures of rare pathological conditions observed in the United States. The list of pictures included the following subjects:

DISEASES DUE TO FILTERABLE VIRUSES:

African horse-sickness.
Bluetongue of sheep.
Rinderpest.
Epithelioma contagiosum.

PROTOZOAN DISEASES:

Piroplasmosis of the horse and dog.
Anaplasmosis.
East Coast fever (a complete set of pictures showing the anatomy and parasitology of the disease).
Trypanosomiasis of cattle, etc.
Leishmaniosis of dogs and mice.
Spirochaetosis of chickens.
Sarcosporidiosis; so-called "Lamziekte".
Chemotherapeutic effects of Salvarsan on *Tryp, brucei.*

*Section on Sanitary Science and Police, A. V. M. A., Oakland Cal., September, 1915.

MISCELLANEOUS:

Crotalism—a specific laminitis due to the poisoning with crotalaria Burkeana, so-called "Stijfziekte".
Specific equine nephritis due to *B. nephritidis equi.*
Paratuberculosis of cattle.
Osteomyelitis in cattle due to *B. necrophorus.*
Osteoporosis of the horse.
Ghon-Sachs infection of the swine (specific gas phlegmon).
Sporotrichosis of domestic animals.
Tuberculosis in pigeons.
Ostitis deformans of the dog, etc.

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PRELIMINARY REPORT ON THE CONGLUTINATION TEST WITH SPECIAL REFERENCE TO THE DIAGNOSIS OF GLANDERS*

C. P. FITCH, Ithaca, N. Y.

The diagnosis of occult glanders in certain cases is not an easy task. The more reliable tests which are used by veterinarians to diagnose this affection in the living animal are:—

1. Bacteriological examination of exudates and secretions for the presence of *Bact. mallei.* This should include animal inoculation.
2. The use of mallein.
3. The sera tests, including agglutination, complement fixation, precipitation and conglutination.

In this country the agglutination and complement fixation tests are in general use. Mallein is employed subcutaneously and ophthalmically. Yet cases constantly arise when the veterinarian is in doubt as regards the presence or absence of glanders. One cannot read the report of Pfeiler and Weber of more than seven thousand sera reactions without being impressed with the difficulties encountered in the diagnosis of glanders. As examples we quote from their report:—

Two horses imported from Russia to Germany gave the following reactions to the blood tests:

*Presented at the meeting of the A. V. M. A. Section on Sanitary Science and Police. Oakland, Cal., September, 1915.

	Agglutination	Complement fixation	Control c. f.	Conglutination
No. 1	1–300	0.2 incomplete	0.2 incomplete	—
No. 2	1–1000	0.05	—	+

No. 1 showed the presence of non-specific complement fixing bodies (as shown above). That is, the serum was anti-complementary, and according to the results of the agglutination and conglutination tests the horse was considered as not infected with glanders. This animal was exported to Denmark and was tested by subcutaneous mallein under the direction of Prof. Bang. The animal reacted positively and as a result of the test was slaughtered. A careful post mortem was made which showed the presence of some nodules in the lungs which were apparently due to strangles. In order to make sure, guinea pigs were inoculated with material taken from these nodules. These test animals did not become infected with glanders. Case No. 1 was apparently a non-glandered animal.

No. 2 gave a positive reaction to the agglutination and conglutination test. To the complement fixation test it gave what is usually called a "paradoxical reaction". That is as shown in the table the serum of this animal was positive in a quantity of 0.05 c.c. However, in larger quantities 0.2 c.c. and 0.1 c.c. (the usual amount tested) the reaction was incomplete or negative in each case. The controls did not show the presence of any anti-complementary substance. Depending on the results of agglutination and conglutination the animal was slaughtered and found to be infected with glanders.

The study of the conglutination test was taken up to determine first whether it was simpler than the complement fixation test and second whether it possessed any advantages over agglutination and complement fixation for the diagnosis of glanders.

The name "conglutination" implies two things. First the agglutination of washed red corpuscles and second, hemolysis of the same. It is based on the discovery of Ehrlich and Sachs who combined in a test tube the fresh blood serum of a horse, the inactive (heated to 56°C. for ½ hour) blood serum of a eow and the washed red corpuscles of a guinea pig. An agglutination of the red corpuscles and hemolysis occurred. This phenomenon was studied further by Bordet and Gay and their interpretation is as follows: "When guinea pig corpuscles are added to a mixture of the two sera (*fresh horse serum and inactivated cow's serum*) they are affected by the sensitizer of the horse serum and to a certain

extent by the sensitizer in the heated bovine serum. This second sensitizer is, however, superfluous. Its presence is by no means necessary for the experiment. When this sensitization is effected the corpuscles are then in a condition to fix the horse alexin. This alexin, however, has only slight hemolytic power. But once the corpuscles have become sensitized and laden with alexin, they are modified in their properties of molecular adhesion to such an extent that they became able to attract the colloidal substance of bovine serum, which unites with them. The adhesion of this new substance produces two results: It causes the blood corpuscles to be more easily destroyed by alexin and also agglutinates them energetically. Consequently, a powerful clumping followed by hemolysis is observed". These authors call this substance present in the normal cow serum "colloide de boeuf" or as was afterwards designated "conglutinine".

The technic of the conglutination test is similar to that employed in complement fixation. In brief, it consists in combining certain definite quantities (previously determined by titration) of normal unheated horse serum, the inactivated blood serum from the animal to be tested and an extract prepared from *Bact. mallei.* Mallein has been used by some authors in place of the extract. These three agents are placed in the incubator for one hour. There is then added the inactivated cow's serum and the washed red corpuscles of the sheep (corpuscles from other animals may be employed) and the tubes are returned to the incubator for one to two hours and then examined.

If the serum came from a glandered animal the red corpuscles settle to the bottom leaving a clear fluid. If the serum came from an animal not infected with glanders the corpuscles are agglutinated in clumps and finally more or less hemolysis occurs and the fluid becomes red. Many variations in this technic are used by different investigators, the more important of which are (1) combining all the reagents at once and (2) allowing the tubes to remain at room temperature. If anyone wishes the details of the method followed they may be found in the reports of Pfeiler and Weber or in the Report of the New York State Veterinary College at Cornell University for 1914–1915 where they will be published in full.

The conglutination test has been employed by Gay and Lucas for the diagnosis of dysentery in man. It has been employed by several workers in the diagnosis of syphilis. Among these should be mentioned Stenge, Jakobaeus, and Siebert and Mironescu.

As previously mentioned conglutination was first employed for the diagnosis of glanders by Pfeiler and Weber in 1912 and reported by them in the Berliner Tierärztliche Wochenschrift. A little later the same year they reported in detail the results of testing 100 horses for glanders by the use of the agglutination, complement fixation and conglutination tests. These animals were divided into four groups. Group I was made up of forty-five animals, each test gave negative results and a careful physical examination failed to detect any symptoms of glanders. These were considered as sound animals. Group II likewise contained forty-five animals which were glandered according to the results obtained by the complement fixation and conglutination method. A careful post-mortem examination showed the lesions of glanders in each case. The agglutination method in 50% of these cases gave a reaction in a dilution of 1–400 up to 1–1000. The author states:—"Only for those not familiar with the technic of the agglutination method does this signify that agglutination has not picked out 50% of the glandered horses". Group III contained four horses. Two of these gave negative reactions to the agglutination and complement fixation tests. They were both positive to the conglutination test. These two animals were killed and carefully examined and old glanders lesions found in each. One of the other two horses reacted positively to the conglutination and agglutination tests, negative to the complement fixation test. This horse showed glanders lesions on post-mortem examination. The other horse gave a partial reaction to complement fixation (0.2) and a very slight reaction to conglutination. On post-mortem no lesions of glanders could be found. Group IV was made up of six normal horses which gave negative reactions to all the tests. These animals were then injected with mallein and after fourteen days the serum of each animal reacted positively to all the tests.

Stranigg working in Dr. Schnürer's laboratory in Vienna studied the conglutination test for the diagnosis of glanders. His conclusion is as follows: "The conglutination method gave reliable, definite and easily determined results in testing thirty-five glandered and forty-seven non-glandered horses".

Anderson, in Prof. Bang's laboratory at Copenhagen used the conglutination test in examining over two hundred horses for glanders. It was used in connection with the complement fixation and the subcutaneous mallein tests. At the conclusion of his work he

states:—"Although the results obtained by the complement fixation test are very accurate, nevertheless I consider the introduction of the conglutination test a valuable addition to the sero-diagnostic methods of detecting glanders".

Michin, working under Pfeiler's directions tested about 200 horses by the conglutination method. Of this number 41 were glandered. He obtained excellent results with the test as proven by post-mortem examination. Reeser in Holland obtained good results in the application of conglutination.

In this country Wehrbeim at Ames, Iowa has used conglutination in the diagnosis of dourine. His conclusions are:—"The conglutination method can be used for the diagnosis of dourine; but it is more sensitive to faulty technic and hence more difficult to employ than the usual complement-fixation method".

We have been experimenting with the conglutination test for more than a year. During this interval over three hundred horses have been tested. The results obtained by the conglutination method have been compared with those obtained by complement fixation and agglutination. Mallein has been used both subcutaneously and ophthalmically in many of the cases. In about 10% of the cases the results of the tests have been checked by a post-mortem examination.

The results obtained by the conglutination method have in general been the same as those obtained by the other sera tests. Anyone familiar with the results of agglutination and fixation know that in many cases there are apparently wide discrepancies. If one studies these, however, and can get a full history of the case these apparent discrepancies are usually explainable. Similar apparent differences exist between the results obtained by conglutination and fixation although not as great. In several cases (12), however, positive results have been obtained by the conglutination test and negative results to both fixation, agglutination and mallein. In none of these cases have we been able to verify the tests by post-mortem examination. One horse reacted negatively to conglutination. Fixation, agglutination and mallein were positive and post-mortem examination showed the presence of glanders.

The preliminary work with this test has brought out certain things.

(1) The effect of the subcutaneous injection of mallein is shown by a positive reaction to the conglutination test later than

by the complement fixation test. On the other hand the positive reaction to conglutination following mallein is much more prolonged than to the complement fixation test. This is in agreement with the findings of Pfeiler and Weber who state that the longer interval is about one month.

(2) So far as we could judge the presence of the specific antibodies of the conglutination test were present as early after infection as those of the complement fixation test. This is in agreement with the work of Waldmann.

(3) The advantage which the conglutination test possesses for the diagnosis of glanders in asses, mules and certain horses whose blood contains non-specific complement binding bodies for glanders by the complement fixation method. The examination of the sera of these animals has always been attended with difficulty owing to the presence of the anti-complementary bodies. Various methods have been suggested for getting rid of these bodies especially the inactivation at a higher temperature (60°C). This anti-complementary or inhibiting action of mule sera is not noted when the serum of the horse is employed as complement. This was brought out in the work of Schutz and Waldmann who recommended for the diagnosis of glanders in asses and mules a hemolytic system of (1) Complement from the horse, (2) Ambocepter from normal cow serum (3) Washed corpuscles of the guinea pig. This they call the "changed complement fixation test". It does not possess so far as we have determined any distinct advantages over the regular conglutination test which it resembles very closely. Pfeiler and Weber have very recently reported excellent results from the application of the conglutination test in the diagnosis of glanders in mules and asses.

(4) The conglutination test does not in every case give positive results in testing the serum of an animal infected with glanders. The percentage of failures, however, is very low. In our work about 0.5%. Failure to show the presence of glanders in certain cases seems to be inherent in any diagnostic method. As Pfeiler and Scheffler state in one of their latest (March 1915) publications on this subject: "Until a few years ago complement fixation was considered the best method for the diagnosis of glanders. Conglutination is likewise an excellent method. The introduction of this latter method showed that complement fixation does not allow the

determination of all cases of glanders. Likewise conglutination may fail in some cases''.

(5) The ophthalmic mallein test does not seem to influence appreciably the results obtained by the conglutination test.

(6) A slight variation in technic may give different reactions in testing the same sera. This is true with the complement fixation as well as the conglutination test. In the agglutination test the strains of *Bact. mallei* employed in making the test fluid often possess widely varying agglutinating properties and this may lead to variable results. There is great need for a standardization of the technic and the reagents employed in the different laboratories in carrying out the various biological tests.

(7) The conglutinating system is a delicate one and careful standardization is even more necessary with this test than with complement fixation. In our work when testing one lot of over seventy-five sera trouble was experienced with the system. Each reagent was carefully retitrated and the sera retested. Again very unsatisfactory results were obtained and the whole discarded. We have tried in every possible way to determine the cause of these failures but have been unable to learn the difficulty. The sensitiveness of this test has already been noted by Wehrbeim.

The conclusions which can be drawn from this work are:

(1) The similarity which exists between the complement fixation and conglutination tests. Both are relatively complex and while the reagents for conglutination can usually be obtained more easily than those for fixation, nevertheless the greater sensitiveness of the conglutination system offsets this advantage. Each method is about equally complex and difficult to carry out.

(2) The decided advantage which conglutination has over fixation for the diagnosis of glanders in asses, mules and those horses which have anti-complementary substances in their blood.

(3) No single sera test is infallible for the diagnosis of glanders. Each test has certain advantages which renders it of value in the diagnosis of this disease.

(4) There is need for a standard method for carrying out each test which shall be employed in the various laboratories. This would tend to reduce the number of discrepancies in the results obtained by the different workers.

The author wishes to acknowledge his indebtedness to Dr. J. B. Hardenburgh of the Pennsylvania Live Stock Sanitary Board

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REFERENCES

ANDERSEN, C. W., Uber die verwertung der Konglutinationsreaktion als diagnostische Probe beim Rotz, *Cent. f. Bakt,* 1 Abt. Orig. Bd. 72 (1913) S. 394.

BORDET, J. ET GAY, F. P., Sur les relations des sensibilisatrices avec l'alexine. *Anal. de l'Inst. Pasteur,* T 20 (1906) p. 467.

EHRLICH UND SACHS, Ambozepter oder Sensibilisator. *Berliner Klinische Wochen.,* 1902, S. 492.

GAY, F. P. AND LUCAS, W. P., The value of the conglutination reaction as a means of diagnosis of acute bacterial infections. *Proceed. of the Society for Exper. Biology and Med.,* Vol. 7, (1910) p, 21.

JAKOBAEUS, Uber die Anwendungs möglichkeit von Konglutinationreaktionen mit Ochsenserum bei Wassermanns Reaktion. *Zeitsch. für Immunforsch,* Bd. 8 (1911) S. 445.

MICHIN, N., Uber die Serodiagnose der Rotz Krankheit mitteles der Konglutininreaktion, *Cent. f. Bakt.* 1 Abt. Orig. Bd. 73, (1914) S. 223.

NEVERMANN, L., Die Rotztligung in Preussen mit Hilfe der Blutprobe, *Berliner Tier Wochen.,* Jr. 30, (1914) S. 580.

PFEILER, W. U. WEBER, G., Versuch einer neuen serodiagnostischen Methode bei der Rotz Krankheit., *Berliner Tier, Woch.,* Jr. 28 (1912) S. 785.

PFEILER, W. U. WEBER, G., Vergleichende Untersuchungen der Sera von 100 Pferden mittels der Agglutinations-Komplement ablenkungs-und Konglutinationsmethode zur Erkennung der Rotzkrankheit. *Zeitsch f. Infek. Krankheit.,* B. 12 (1912) S. 397.

PFEILER, W. U. WEBER, G., Die Technik der Konglutinationsreaktion zur Ermittelung der Rotzkrankheit. *Mitteilungen des Kaiser Wilhelm-Institutes für Landwirtschaft in Bromberg.* Bd. 5. (1913) S. 255.

PFEILER W. U. WEBER, G., Bericht über die in Bromberg im Etatsjahre 1912-13 ausgeführten Blutuntersuchungen zur Ermittelung der Rotzkrankheit. *Mitteilungen des Kaiser Wilhelm Instituts für Landwirtschaft in Bromberg.* Bd. 6 (1914) S. 227.

PFEILER, W., Mitteilungen über die Serodiagnose der Rotzkrankheit. *Berliner Tier. Wochen.* Jr. 30 (1914) S. 741.

PFEILER, W. U. SCHEFFLER, F., Mitteilungen über die Serodiagnose der Rotzkrankheit. *Berliner Tier. Woch.* Jr. 30 (1914) S. 789.

PFEILER, W. U WEBER, G., Die Serologische Feststellung der Rotzkrankheit bei Eseln, Mauleseln, Maultieren sowie Pferde mit sog, nicht-spezifischer Hemmung der Komplementablengung. *Zeitsch. f. Infek. Krankheit.* Bd. 16 (1915) S. 311.

PFEILER, W. U. SCHEFFLER, F., Mitteilungen über die serodiagnose der Rotzkrankheit. *Berliner Tier. Wochen.* Jr. 31 (1915) S. 121.

SCHUTZ UND WALDMANN, O., Der serologische Nachweis der Rotzkrankheit bei Eselin und Maultieren. *Archiv. f. Tierheilkunde.* Bd. 40 (1914) S. 501.

SIEBERT, C. U. MIRONESCU. Uber die Brauchbarkeit der Syphilisreaktion nach Karvonen. *Deutsche Med. Wochen.* Jr. 37 (1911) S. 2084.

STRANIGG, H., Zur Diagnose der Rotz durch Konglutination. *Zeitsch f. Infek. krankheit.* Bd. 14 (1913) S. 166.

STRENGE, O., Die Konglutination und die Diagnose der Syphilis. *Zieglers Beiträg zur pathol. Anatomie.* Bd. 51 (1911) S. 279.

REESER, H. E., Die Konglutinationsmethode. *Folia Microbiologica.* Jr. 3 (1914) S. 15.

WALDMANN, O., Untersuchungen über die Brauchbarkeit der Konglutinationsmethode für die Serodiagnose der Rotzkrankheit der Pferde. *Archiv f. Tierheilkunde.* Bd. 40 (1914) S. 382.

WEHRBEIM, H., Conglutination in the diagnosis of Dourine (Trypanosomiasis of the horse). Jour. Infec. Dis., Vol. 16, (1915) p. 461.

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ABSTRACT OF DISCUSSION.

DR. ————: I want to say a few words in regard to the conglutination test as we have employed it in connection with the diagnosis of glanders to a limited extent. Our object in undertaking this test was to determine the comparative value of this test as compared with the complement fixation and agglutination tests. On the whole I think the agglutination test gave the best results. The conglutination test was also quite satisfactory, as was the complement fixation, but the agglutination test was superior to the conglutination test. As Dr. Fitch states in his paper, there is no doubt that it would have an advantage in those cases where anti-complementary substances interfere with the test, but we appear to have overcome this difficulty by simple inactive serum mixed with a salt solution. In that way we get a quicker reaction, and even in cases where the reaction was indistinct, by the inactive serum and the salt solution we invariably got more pronounced and better reaction. This we also employ in the diagnosis of dourine, and also it was found that the reaction is very pronounced and the reading is more accurate than when the process is carried on without the salt solution.

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A DISEASE RESEMBLING "FORAGE POISONING" IN HORSES AND MULES, WHEREIN OAT HAY INCORPORATED THE PRIMARY FACTOR

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In bulletin 167 of the Kentucky Agricultural Experiment Station there appears an account of a fatal disease which affected horses, mules and cattle in 1911 and 1912. The most pronounced symptoms were paralysis of the pharynx, incoördination of the voluntary muscles, with varied nervous manifestations, followed by general weakness, in which state the affected animals lay broad-

side for a few hours to two or three days, suffering intermittent muscular tremors before death. The corn in several outbreaks observed in 1911 was examined and found to be infected with fungi. An attempt to reproduce the disease by feeding mouldy corn failed, but notwithstanding the absence of experimental confirmation, mouldy feed was considered to be closely associated with the disease.

It seems quite probable from the clinical symptoms of this disease that if bears a close similarity to a more recent outbreak in Central Kentucky. In January of this year (1915) our attention was called to a fatal disease among horse and mule stock on the Griffith stock farm near Lexington, wherein it was found that losses totalled approximately twenty head during a period of four months. The majority of these animals succumbed during a period of thirty days. The following symptoms were observed in affected animals: dull, languid appearance, partial paralysis of the pharynx, salivation, marked weakness, as evidenced by unsteady gait, and various nervous manifestations, followed by prostration in six to eight hours. An animal once down was unable to rise unassisted, and death followed in twelve to sixty hours. Of all animals affected only two survived. These two animals were placed in slings and by careful nursing gradually recovered after a period of sixty days.

Autopsy and gross observations on animals naturally as well as experimentally affected did not reveal any signal changes upon which a diagnosis might be based. The macroscopical lesions observed in afflicted animals consisted of injection of the capillary blood vessels; the mucosa of the stomach and intestines contained scattered petechial hemorrhages, quite pronounced in some animals, yet scarcely perceptible in others. The same condition prevailed in the serous membranes of the body. The contents of the small intestines and stomach were generally of a fluid nature and occasionally of a greenish color, while impaction was frequently found in the colon. The lungs were, without exception, congested and sub-pleural hemorrhages were found.

A diagnosis of forage poisoning was made by Dr. E. R. Mumma of Georgetown, Kentucky, Dr. S. F. Musselman, State Veterinarian, and by Drs. W. H. Simmons and O. S .Crisler of the Experiment Station staff and the authors. On examination the corn was found to be infected with fungi, but we were informed by assembled farmers of the community that similar tainted corn was being fed

by other stockmen in the immediate locality with no ill results. However, our previous experience with a similar disease led us to suspect the corn.

Later reproduction of the disease experimentally in horses should classify the disease in question primarily as a forage poisoning, until more definite information regarding the etiology of similar diseases is obtained, as the oat hay on this farm when fed to experimental animals, independent of other feeds on the premises, resulted in clinical manifestations of the disease. Oat hay or sheaf oats, as it is sometimes called, is fed extensively on Kentucky stock farms to this class of live stock. There has been very little or no evidence in our observations heretofore that this feed might in some cases incorporate the fatal factor which is responsible for losses to the horse and mule industry of our State. A correct diagnosis and the establishment of the feeds involved is therefore of the greatest importance, as there is scarcely a month during the winter season that losses from this disease are not reported.

It seems quite difficult to make a differential diagnosis of Cerebro Spinal Meningitis (Forage Poisoning) Mohler[1], Cerebro Spinal Meningitis (Encephalitis), also known by some as "Kansas horse disease", Udall[2], Meningo-Encephalitis (Blind Staggers) Haslam[3], Encephalo-Myelitis, Stange[4], Epizootic Cerebro Spinal Meningitis, Hickman[5], and true forage poisoning, Pearson[6], as occurring in various parts of the United States, and of Borna's disease, Hutyra and Marek[7], as occurring in Europe. "Forage poisoning" according to Pearson is a disease resulting from ingestion of an infective agent incorporated in the feed, wherein there exists an inseparable relation between the feed and the poisonous material. Though it seems to be true that this relation cannot always be established, there is no conclusive evidence that such a relation might not exist. Udall's observations in Kansas, like Milks'[8] in Louisiana and Williams'[9] in Idaho, concluded that the evidence gained in their studies would not justify the association of a similar disease with a specific contaminated feed, in the sense that Pearson implied. In this connection our attention was forcefully called to the fact that it is possible for apparently clean, bright feed to produce a fatal disease resembling forage poisoning, suggesting the possibility that forage and grain contamination is not always associated with visibly mouldy or inferior feedstuffs. Prof. E. J. Kinney, Associate Agronomist of the Experiment Station, examined

the oats containing the poisonous agent and pronounced them to all outward appearances of first rate quality. Chemical analysis of the nitrogen content by Prof. E. H. Nollau, Assistant Research Chemist, indicated that the analysis of these oats did not vary

CHART A

DISTRIBUTION OF NITROGEN IN PERCENT.

	WHOLESOME NORMAL OATS	GRIFFITH'S OATS
Ammonia N	13.31	13.80
Melanin N	2.97	1.18
*Cystine N	4.48	2.43
Arginine N	11.42	11.40
Histidine N	9.58	7.18
*Lysine N	.....	2.48
Amino N, filtrate (1)	43.49	44.57
Non amino N, filtrate (2)	11.07	17.28

(1) Mono-amino-acids.

(2) Proline, oxyproline, etc.

*There is possibly a slight error in the cystine determination, in which the cystine is too high and the lysine correspondingly low. The absence of lysine in normal oats has not been definitely proved.

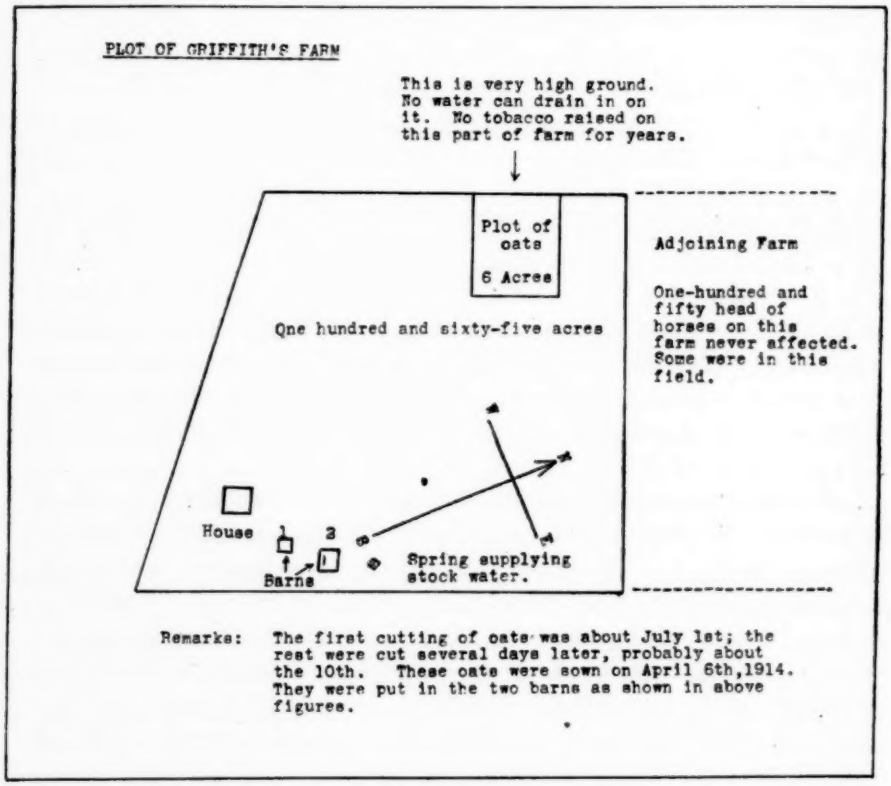
markedly from that of wholesome oats (see Chart A). Disregarding the possibility of spoiled feed, it is suggestive that conclusions from physical examination are not always to be relied upon, even if feed of a visibly inferior quality (infected with moulds) constitutes a portion of the ration.

DIFFICULTY SOMETIMES ENCOUNTERED IN DETERMINING FEED INVOLVED. We have made observations on three farms this year in addition to the one described herein, where a disease resembling forage poisoning existed. The history and symptoms of afflicted animals were indistinguishable from the disease occurring on the Griffith farm as produced by the oat hay. Feeding experiments conducted with the various feeds from these farms resulted negatively. In such cases it is probable that only a limited amount of feed might contain the fatal material, or a marked tolerance to the same might prevail in some animals. The fact that some animals are markedly resistant is illustrated by one of our experimental horses, which ate heartily for thirty days of oats from the Griffith farm without fatal results. This animal evidenced a very sluggish attitude on or about the tenth day, but recovered and remained apparently healthy during the remainder of the experiment. This

animal was a hearty eater and consumed approximately ten times the quantity of oats consumed by any one of the other experimental animals. In all experimental horses, with this one exception, the feeding of the oats terminated fatally.

HISTORY OF THE OATS. In connection with this outbreak it was found that the seed of these oats was originally purchased from a local seed store. No doubt other farmers received oats from this lot, though this information could not be definitely determined. They were sown on April sixth, 1914, in a six acre field, on the highest ground on this farm, as indicated by Chart B. They made a

Chart B


PLOT OF GRIFFITH'S FARM
This is very high ground. No water can drain in on it. No tobacco raised on this part of farm for years.
Plot of oats
6 Acres
Adjoining Farm
One-hundred and fifty head of horses on this farm never affected. Some were in this field.
One hundred and sixty-five acres
House
1
2
Barns
Spring supplying stock water.
Remarks: The first cutting of oats was about July 1st; the rest were cut several days later, probably about the 10th. These oats were sown on April 6th,1914. They were put in the two barns as shown in above figures.

normal growth and were cut when medium ripe and harvested on the fifth of July. A hay mower was used to cut this grain and it was handled as ordinary hay. It was placed in barns Nos. 1 and 2. Barn No. 1 is small and from the supply placed in this barn the driving horse was fed throughout the winter with no ill effect. The oats placed in barn No. 2 were for general use, and late in the

fall were fed to the horse and mule stock. This barn was accessible to chickens and some had made use of this loft as a roosting place in preference to the regular quarters provided for the poultry on this farm. Chickens could not gain access to barn No. 1.

METHOD OF DETERMINING FEED INVOLVED. The ration fed to the horse and mule stock on this farm consisted of ear corn, corn fodder, clover hay and oat hay, with water from a nearby spring. Of these feeds the ear corn was suspected, and in order to prevent further losses it was considered advisable for the owner to discontinue feeding it. These instructions were carried out faithfully, and on the strength of the mouldy corn being responsible for the disease, a team of mules was purchased for ordinary farm work. They received the feeds mentioned above with the exception of the corn. One of the newly purchased animals was found in a dying condition on the sixth day after delivery to the farm, and on the fourteenth day the other animal was down, indicating that the corn was not primarily involved in these losses as we had originally supposed. In order to determine if any feed could be incriminated, and if so which one was associated with the disease, two horses (No. 1 and No. 2) were purchased and placed in small barns used for the housing of farm implements, neither of which had been used as horse or mule stables on the farm.

Horse 1 (see Chart 1) was allowed shelled corn and clover hay. The water supplied consisted of a watery extract of the corn made by immersing two bushels of this shelled corn in a barrel of water. This was placed in the stall and made available to the animal at all times. No record of the amount of feed and water consumed was made, but it was aimed to supply same in such quantities as would be consumed by the animal each day. On the second day of this experiment one of the farm mules belonging to the owner was found to be acutely ill, presenting symptoms similar to those observed in animals previously afflicted. At this time it was considered advisable to determine if the blood of an animal in a moribund condition would transmit the disease if injected into healthy horses. A transfusion from the jugular vein of the afflicted animal (mule 15) to horse No. 1 was made. For twenty-eight days following this and thirty days following the feeding of the corn and clover and the drinking of the watery extract of the corn, no change in the condition of the animal was manifest. (Chart 1).

CHART 1.

HORSE No. 1.

DATE	PLACE	FEED	Temperature	SYMPTOMS
March 10	Griffith's Farm—Box stall in which no horse or mule stock had been placed for several months.	Shelled corn and clover hay. Watery extract of corn to drink. Water from cistern near house; had not been used heretofore for stock purposes.	N	None observed.
March 11	" "	" "	N	" "
March 12	Injected intravenously with 5 c c. blood from mule in moribund condition, found naturally affected on this farm.		N	" "
March 13	" "	" "	N	" "
April 10	" "	" "	N	" "

Temperature taken every day—did not register abnormal.

DISCUSSION: No evidence was obtained that these feeds, i. e. corn or clover hay, which were being fed to the horse and mule stock on this farm, were deleterious to this animal.

Horse No. 2 (see Chart 2) was allowed an exclusive ration of oat hay, which was supplied as rapidly as consumed, and a watery extract of the oat hay to drink, made by placing the hay in a barrel and filling it with water.

On the second day this animal was injected with 5 c. c. of blood drawn from mule No. 15 in a moribund condition. There was no change in the method of feeding as outlined for horses 1 or 2 following the injection. On the morning of the second day following the blood injection, horse No. 2 was dull and sleepy. A nasal discharge was observed, which the owner stated was quite characteristic of the early stages of the disease as observed in animals naturally affected on the premise. The next morning the animal was down and unable to rise. The following day it was destroyed in a dying condition. This seemed to narrow the problem down to two things, i. e. the oat hay or contagion as a result of blood injected.

Horse No. 3 (see Chart 3) was placed in a paddock adjoining the regular horse barn and was given oat hay each day. For drinking water this animal had access to the spring from which the horse and mule stock on this farm had been previously supplied. This animal was not accessible for examination from day to day owing to lack of previous handling. On the seventh day horse No. 3

CHART 2.

HORSE No. 2.

DATE	PLACE	FEED	Temperature	SYMPTOMS
March 10	Griffith's Farm—Stable in which no horse or mule stock had been placed for several months.	Oat straw hay; watery extract of same to drink. The water was obtained from cistern near house; had not been used heretofore for stock purposes.	N	
March 11	" "	" "		
March 12	Injected with 5 c.c. blood intravenously from mule in moribund condition, found naturally affected on this farm.			
March 13	" "	" "		
March 14	" "	" "	N	Slight nasal discharge of a mucous nature.
March 15	" "	" "		Animal down in morning and unable to rise. Increased respiration. Intermittent movement of the legs as if running.
March 16	" "	" "		Destroyed.

Normal temperature as recorded each day by owner.

DISCUSSION: This animal evidenced symptoms similar to animals naturally affected on this farm, and narrowed the problem to the possibility of contaminated oat hay or the transmissibility of the disease by blood inoculations. Inasmuch as Horse No. 1 was inoculated with blood from an infected animal with negative results the suspicion was cast on the oat hay.

could be approached and to all appearances seemed very tired and depressed. The following day this animal was down, unable to rise, and was later destroyed. This result further incriminated the oat hay, yet it did not remove all possibilities of infection, as the water supply was common to all naturally affected horses and mules, and the possibility of stable or pasture infection still remained. It was suggestive, however, in that two experimental animals receiving the oat hay in question under somewhat different conditions succumbed, as it was first thought this feed was entirely foreign to the original losses on this farm.

CHART 3.

HORSE No. 3.

DATE	PLACE	FEED	Temperature	SYMPTOMS
March 13	Griffith's Farm—Blue grass paddock.	Oat hay and water from spring which supplied horse and mule stock on this farm.		
March 14	" "	" "		
March 15	" "	" "		
March 16	" "	" "		
March 17	" "	" "		
March 18	" "	" "	Not taken.	
March 19	" "	" "		Depressed.
March 20	" "	" "		Animal unable to stand; increased respiration; severe bruises about head and feet, self inflicted. Muscular tremors. There was a very disagreeable odor from this animal.
				Destroyed.

REMARKS: The moribund condition of this animal incriminated more strongly the oat hay which was being fed on this farm, but it did not exclude the possibility of premise infection, as animals had previously succumbed to this disease while pasturing in this paddock and upon receiving the same water supply.

AVOIDING PREMISE INFECTION. In order to obtain further evidence of the incrimination of the oat hay and at the same time exclude all possibility of premise infection, the oat hay was delivered to the Experiment Station farm where it was fed to three experimental horses C, D, E, (see Chart 4). In addition to the oat hay, water was given these animals from a twenty gallon earthen container, in the bottom of which was placed oat hay. This feed and water were supplied in the quantities desired by each animal from the beginning of the experiment, and no inclination on the part of any animal to discriminate against the oat hay or water was observed.

As controls, an experimental horse F (see Chart 4) was placed on the Griffith farm and stabled in the horse barn (barn No. 2) where animals had naturally succumbed. This animal also had

the run of a paddock in which other animals had become naturally affected. The water supplied this animal was from a spring which had been the source of water for all horse and mule stock on this farm. The feed consisted of clover hay from the Experiment Station farm.

CHART 4.

METHOD OF DETERMINING FEED INVOLVED

Place.	Experiment Station.											
Animals.	Horse C. Horse D. Horse E.											
Feed.	Oat hay as received from Griffith's Farm, and watery extract of same to drink.											
Temperature.	HORSE C	Mar.	10	11	12	13	14	15	Moribund condition. Destroyed.			
			98.2	98.2	98.4	97.2	98.6	97.8				
	HORSE D	Mar.	23	24	25	26	27	Moribund condition. Destroyed.				
			99.9	98.	100.	0.3	98.					
	HORSE E	Mar.	28	29	30	31	Ap. 1	2	3	4	5	6
			99.2	97.8	98.0	99.1	99.3	98.2	99.2	98.1	99.4	97.4
		Apr.	7	8	Moribund condition. Destroyed.							
			98.3	98.1								
	REMARKS: Horses C, D, E evidenced symptoms observed in animals naturally affected in this outbreak. The water given animals to drink, in the form of extract of oats, had been used for horse and mule stock on the Experiment Station farm, thereby excluding the water as a factor. These animals appeared normal until the day before they were down and found in a moribund condition.											

CONTROLS.	HORSE F March 10—April 20	MULE A
Place.	Griffith's Farm; in stall and paddock where horses had been stabled, later died, evidencing characteristics of the disease.	Experiment Station Farm; in stall adjacent to Horse E, with no partition. Halter tied so that mangers were entirely separated, allowing no interchange of feed.
Feed.	Clover hay from Experiment Station farm.	Clover hay from Experiment Station farm.
Water.	Water from spring which had supplied horse and mule stock of this farm.	Farm water as used for horses C, D and E.
	REMARKS: Horse F and Mule A remained healthy to all appearances during this time.	

Mule A was placed in an adjacent stall to horse E, with no partition between. Horse E was being fed the oat hay in question (see Chart 4). Horses C, D, E receiving oat hay all succumbed, while the controls, horse F and mule A, remained healthy, indicating that the disease in question was a true forage poisoning, not transmitted by contact but through the ingestion of this feed only.

Grain and Straw Incorporated Primary Cause. Having once established evidence that the causative agent of this outbreak was associated with the oat hay, the part of the oat hay incorporating the primary factor, i. e. the grain or the straw, was sought. To prepare for this it was necessary to thrash the oat hay and separate the grain from the straw. This was first accomplished by whaling on a tarpaulin, but later a threshing machine was employed so that larger quantities of the grain might be made available. One horse was fed the straw, another was fed the grain. Each developed symptoms of the disease, which terminated in a moribund condition.

Susceptibility of Different Animals. If some of the smaller animals could be proved susceptible to this condition, the further study of the disease experimentally would be greatly facilitated. To this end, two horses, a goat, a sheep, a pig, a rabbit, a guinea pig and a white rat were inoculated intravenously and subcutaneously, as indicated in Chart 5, with blood drawn from experimental horse No. 2 when in a moribund condition. The results of the inoculation proved negative.

The grain portion of the oats was fed to hogs, supplemented with corn meal, to white rats, supplemented with milk, and exclusively to sheep, goats, rabbits, guinea pigs and chickens. The results of this experiment (see Chart 6) were negative, thus ending the possibilities of making further observations on smaller animals by the methods described.

Foreign Material in Oats. Following the threshing of the oat hay, considerable quantities of dried chicken excreta were found in the grain. Evidently this material distributed through the oat hay had been shaken from the straw and allowed to accumulate in the grain during the threshing process. An inspection of the oat hay before threshing revealed only occasional contamination of this material. On passing through the fanning mill to obtain the threshed grain free from all foreign material, the relative quantity of foreign material, including dried chicken fecal excreta, was found to be greater than had been expected. The possibility of this mater-

CHART 5.

COMMUNICABILITY OF THE DISEASE

Place	Animals Inoculated	Source of Blood	TEMPERATURE					
			Date 1915	Horse A	Sheep	Goat	Pig	Horse B
Experiment Station	Intravenously Horse A—5 c. c. Horse B—5 c. c. Goat—5 c. c. Sheep—5 c. c. Pig—5 c. c. Rabbit—2 c. c. Subcutaneously Guinea Pig—2 c. c. White Rat—1 c. c.	Drawn from Horse No. 2 when in moribund condition.	Mch. 17	98.2	2.	2.1	1.3	99.
			18	99.	2.	2.1	3.	98.2
			19	98.	2.3	2.	3.4	100.
			20	100.	3.1	2.	4.2	100.
			21	100.	2.1	2.2	1.2	99.2
			22	100.	2.4	2.3	1.4	99.3
			23	97.2	3.4	2.	1.2	98.6
			24	98.	2.4	2.3	2.	99.
			25	97.2	3.1	2.4	2.	99.3
			April					
			10	98.4	3.2	2.2	2.	98.1
			11	99.2	2.	2.	2.1	99.

REMARKS: The animals indicated above showed no ill effects from the injection of the blood, indicating that the disease was not propagated in the blood nor transmissible by inoculation to these animals.

CHART 6.

SUSCEPTIBILITY OF OTHER ANIMALS TO OATS WHICH PRODUCED DEATH WHEN FED TO HORSES.

Place	Feed	Animals	Temperatures						Symptoms	
			Date 1915	Pig 6004	Pig 6019	Date 1915	Sheep	Goat		
Experiment Station	Oat grain, oat straw, hay and watery extract of same to drink.	Pig 6004 Pig 6019 Sheep Lamb Goat and Kid Two Rabbits Two Chickens Four White Rats Four Guinea Pigs	Mch. 7	2.4	2.2	April 1	2.	3.	None observed	
			8	4.3	1.2	2	2.	3.	"	"
			9	1.6	2.6	3	3.	2.		
			10	3.	1.	4	2.2	1.1	"	"
			11	2.4	1.	5	2.	1.3		
			12	2.5	2.1	6	2.4	1.3	"	"
			13	3.4	4.1	7	3.	2.3		
			14	3.4	3.3	8	2.3	1.4	"	"
			15	4.1	3.2	9	2.3	2.1		
			16	4.4	3.5	10	3.	2.4	"	"
			17	3.1	2.4	11	2.4	2.3		
			18	3.5	4.2	12			"	"
			19	3.4	3.3	13				
			April 1	2.4	2.1	26	1.3	2.2	"	"
			2	4.2	3.1	27	2.4	3.1		
			3	4.4	3.5	28	2.2	2.3	"	"
			4	3.4	3.1	29	2.1	2.3		

REMARKS: It was necessary to supplement the oats with bran and corn meal when fed to pigs, as the exclusive feeding of oats resulted in malnutrition. No change could be noted in the small animals as the result of eating the oats.

ial lowering the vitality of animals receiving the oats was not questioned, but it was thought advisable to determine if it incorporated the primary factor exclusive of the oats, by feeding same disguised in wholesome feed to an experimental horse. On the fourteenth day this animal evidenced symptoms as observed in other afflicted animals.

An explanation of the relation of this material to the oats is not attempted, but it is important that chicken excreta found in feed when fed to horses produced symptoms similar to those evidenced by horses fed the oat hay in question. The supply of this material gathered from the oats was limited and did not permit of further experiment.

The feeding of dried chicken and pigeon excreta from other sources, disguised in wholesome feed, resulted negatively in experimental horses. The excreta of chickens fed exclusively on the Griffith oats, disguised in wholesome feed, resulted negatively when fed to experimental horses, as well as the dried contents of the intestinal tract, brain and liver of horses fatally affected as the result of eating the Griffith oats. (See Chart 7). The carcass of

CHART 7.

NO EFFECT EXHIBITED BY HOGS EATING CARCASS OF HORSE AFFLICTED WITH THE DISEASE

DATE	PLACE	FEED	ANIMALS	SYMPTOMS
1915				
March 15	Griffith's Farm	Carcass of horse No. 2; and corn.	Twenty shoats weighing from fifty to one-hundred pounds.	None observed.
March 16	"	"	"	
April 5	"	"	"	

REMARKS: During the time the fleshy portion of the carcass was being consumed no ill effects were observed. At the end of twenty days the carcass was completely consumed except the bony skeleton. The corn which was fed to the hogs in connection with this carcass, was from the same lot which had been given to horse and mule stock, as well as experimental horse No. 1.

one horse was consumed by twenty thrifty shoats with apparent relish, followed by no noticeable change in the health of the hogs.

Since these observations, State Veterinarian Musselman investigated an outbreak of a fatal disease in horses resembling forage poisoning, wherein chicken fecal excreta seemed to be involved. On

visiting the farm where horses had died, he found two animals affected. Two barns for storing feed and housing the horse stock were in use, which we will designate as barn A and barn B. The feed from barn A was hauled to barn B for feeding the animals stabled therein. No sickness was observed in barn A which originally stored all the feed, but feed from this stable seemed to be responsible for a disease resembling forage poisoning occurring in barn B. It was later found, after careful inspection, that barn B had been used for housing chickens and that large quantities of chicken excreta still remained. In placing the feed in the mangers, indefinite amounts of this litter were unavoidably included. The type of the disease as observed by Musselman in the two animals affected and as described by the owner and the local veterinarian in previously affected animals, resembled so-called "forage poisoning." The local veterinarian in charge designated the condition as "a paralysis of the throat."

The possibility of chicken excreta contaminating feed to the extent of resulting fatally when fed to stock is not a serious problem on well managed farms, but it seems worthy of more careful observations in connection with fatal diseases of horses and mules wherein symptoms resembling forage poisoning are manifest, in order to determine the relation existing therein.

Contaminated Water as a Factor. It is not known just what role farm water supplies might play in this disease. To obtain evidence of the possible danger of feed contaminating water supplies, the cleaned threshed oats were placed in cotton bags in the bottom of a twenty gallon earthen container and covered with water. Fresh oats were supplied every third or fourth day and the water replenished as consumed by the animal. From this jar horse No . 4 was allowed to drink, receiving corn meal, wholesome oats, and clover hay as a ration (see Chart 8). A period of twenty-three days from the time the watery solution was first allowed elapsed before any symptoms were manifest. On the twenty-fourth day the animal appeared very weak and incapable of standing, presenting symptoms similar to animals previously affected.

Poisonous Factor in Oats not Transmitted from One Generation of the Plant to the Next. To determine if the poisonous factor in the oats was propagated in the germ cell of the grain, three plots of ground 50x100 feet were prepared and sown. To all appearances these oats made a normal growth, and when ripe were

CHART 8.

CONTAMINATED WATER AS A POSSIBLE FACTOR IN FORAGE POISONING.
HORSE NO. 4.

PLACE	DATE	FEED	WATER	SYMPTOMS
Experiment Station	April 13	Corn meal; clover hay from Experiment Station Farm	Water in which oats had been soaked.	
	May 6	"	"	Animal dull.
	May 7	"	"	Animal down and unable to rise.

REMARKS: The poison was probably taken into the animal's system through the drinking water. This animal ate and drank heartily until the evening of May 6th, when it appeared dull. Was unable to stand the following day.

cut with a hand scythe. They were fed to an experimental horse daily over a period of four weeks, supplemented with corn meal. No ill effects noted, suggesting that the primary factor in the original oats is not transmitted to the next generation. The remainder of this crop of oats will be fed during the month of January in order to duplicate as nearly as possible the time elapsing from harvest until the original oats were fed with fatal results.

CONCLUSIONS

It is evident from these observations that a particular lot of oat hay was responsible for the outbreak of "forage poisoning" occurring on the Griffith farm and that this disease could be induced in experimental animals (the horse) by the feeding of this material to experimental animals over a period of time which resembled in a measure the incubation period of some infectious animal diseases; also that drinking water contaminated with these oats resulted fatally when given to experimental animals. Other animal species, i. e., guinea pigs, rabbits, chickens, swine, white mice, goats and sheep, were apparently non-susceptible. It is of interest to note that the oat hay responsible for this disease, though apparently clean, was later found to be contaminated with the excreta of chickens, which on being fed disguised in wholesome feed resulted fatally. Up to this time, however, we have not been able to isolate the causative factor of the disease occurring as a result of feeding this particular lot of oat hay, nor have we been able to show that oat hay from other sources produces "forage poisoning" in horses and mules.

LITERATURE CONSULTED

1. *Bulletin 65*—Bureau of Animal Industry, 1914.
2. Reprint, *Cornell Veterinarian*, June, 1913.
3. *Bulletin 173*—Kansas Expt, Station, 1910.
4. *American Veterinary Review*—Vol. 42, January, 1913.
5. *Circular 122*—Bureau of Animal Industry, 1906.
6. *Report of the State Veterinarian, Annual Report of the Dept. of Agriculture of Pennsylvania, 1902.*
7. *Pathology and Therapeutics of the Diseases of Domestic Animals,* HUTYRA AND MAREK.
8. *Bulletin 106*—Louisiana Exp. Sta., July, 1908.
9. *Bureau of Animal Industry Report for 1897.*

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OF INTEREST TO SOUTHERN PRACTITIONERS

H. B. F. JERVIS, Columbia, S. C.

On settling in the "Sunny South", for practice, I was almost at once confronted with the so-called "black-tongue" of canines. I had heard of, and had frequently read, in the various journals, accounts of this dreaded malady, but since last Spring seeing an article from Florida attributing the cause of this disease to the hook worm, I had supposed that I would find that the disease was well in hand.

On getting my first case, I naturally made a microscopic examination of the feces for hook worm ova, but failed to get any results, and I may say in many subsequent searches I have also failed to find any semblance of one. Though many veterinarians, and many Doggie M.Ds. were using thymol, and in a few instances claiming results; the fact of finding no ova headed me off from that track altogether. I must make admission that quite a few of my earlier cases died, and that promptly, but that left me the privilege of several autopsies, and I was only too glad to take advantage of them.

I will here state that my experience has been confined to the immediate vicinity of Columbia, S. C., and I will here relate the symptoms as met with here.

SYMPTOMS. Marked lassitude and general malaise, complete inappetence, temperature usually sub-normal, occasionally normal, but never above normal. Blood-stained fluid feces, passed with great evidence of pain, very marked fetor *ex ore,* a peculiar con-

dition of the skin, best described as paper skin. If one takes up a hand full of skin, instead of the normal elasticity, one finds that the fold of skin so taken up remains wrinkled for some time, only slowly going back to its normal position.

One other symptom first called to my attention by a southern colleague, was when the disease is said to be confined to the intestines; on passing one's thermometer into the rectum, on removal it is blood-stained. This is a fair description of the general symptoms met with here.

Until recently, I had seen no cases of black-tongue with lesions in the mouth, and was beginning to be quite disappointed, until one day a client of mine, Mr. J. C. D., for whom I had treated a case of the intestinal form, and the dog made a recovery, rang me up saying that he had another dog taking the black-tongue, and would like me to come to his house at once.

On arrival, I found a well bred pointer bitch, mother of the one which had recovered, decidedly ill, refusing all food, and giving off the most vile odor that one can imagine. Long strings of saliva were hanging from the angles of the lips, and on examining the mouth I found great streaks of the gums were in the process of sloughing; the tongue was intensely inflamed, and great patches of it were beginning to slough. The bitch showed every symptom of absorption, terrible fetor *ex ore,* emaciation and weakness. The bitch posted on to a quick finish, and died in forty-eight hours. Just before she died, the owner brought me his third and last dog showing exactly the same symptoms, though perhaps not quite so bad as the bitch was at that time, but afterwards proving just as bad a case.

On getting the bitch over to my place, the first thing I did, was to get hold of a colleague of mine, and get his opinion on the case, as I had already formed an opinion that here we had an entirely different condition to the former cases of black-tongue, confined to the intestinal tract, and felt sure that this case, showing these mouth lesions, was a condition with which I was quite familiar, having met with it sporadically, not only in the frigid zone of Aroostock County, Maine, but also in England and Canada, and this condition is nothing else but the "Necrotic Stomatitis" of the various text-books. My colleague at once made the diagnosis of black-tongue, and several of the Doggie M.Ds., also made the same diagnosis, saying, "There is a real old fashioned case of black-tongue

so well known in the southern states.'' In spite of this positive stand taken, I kept to my opinion, and I may say that my opinion is the same to-day and that this so-called black-tongue is nothing else than the well known ''Necrotic stomatitis'' of canines.

Post-Mortem Findings. On those dogs afflicted with the so-called intestinal form of black-tongue, the following lesions were invariably present:—marked inflammatory changes in the alimentary canal; the mucous membrane of the stomach, and the entire intestinal tract is swollen, and its surface shows numberless hemorrhagic spots varying from a pin's head up, and the presence of a profuse dark brown colored mucus is noted. Most of the organs are markedly hyperemic. The mesenteric glands are swollen and show hemorrhagic centres. This set of symptoms compares very vividly with those recorded by Hutyra and Marek, under canine typhus, or gastro-enteritis hemorrhagicum, and by Law, Vol. II, p. 256, under hemorrhagic gastro enteritis of dogs.

On those cases showing the so-called black-tongue, with lesions confined to the mouth, a complete absence of any of the former lesions is noticed, and one merely finds the following:—the region of the gums is of a dark red, brownish or purplish hue; the entire tissues of the mouth assume a spongy condition, and before death bleeds very easily on pressure. The affected parts, take on later a yellowish hue, and the superimposed parts are found to be of a soft jelly-like consistency. On peeling this off from the diseased gums, etc., one finds a large ulcerous area, with irregular and jagged edges. This compares very favorably with the symptoms of stomatitis ulcerosa, necrotic stomatitis, ulcerative stomatitis of carnovira, etc., variously recorded by Law and others.

''I will now drop the term ''intestinal form of black-tongue,'' and from now on will speak of it as ''hemorrhagic gastro enteritis of dogs.'' In all my cases of gastro enteritis of dog cultures upon agar and blood-serum, proved negative, giving no growth whatever from heart's blood or any of the organs. In cases of necrotic stomatitis, I got a pure culture of *Staphylococcus pyogenes aureus* from the mouth, though I can quite conceive that in some cases one might get cultures of the *Bacillus necrophorus,* or in fact any other organism, but in my cases it has happened to be the staphylococcus.

Causes. (Gastro-enteritis canum) These are not very well known, but Law looks upon the cause as a poison, probably of the nature of a toxin or toxins taken with the food or water,

STOMATITIS ULCEROSA. Saunders says this condition is generally seen in old, debilitated dogs, and in weakly, anemic and pampered dogs of all ages. My experience has been that one meets with it in dogs of all ages, sorts and conditions. I have seen it in the pampered dog; the out-door farm dog and the lap dog in northern Maine. In the South, it has been mostly in hunting dogs, owing chiefly to their predominance above other kinds in this section. Law gives as possible causes, general lowering of health, in connection with privation or disease, especially distemper, etc. Superadded to all these, is the bacterial infection of such diseased parts, through which the ulceration is started, maintained and extended. This infection not being that of a specific organism, but usually of a multiplicity of the organisms that live in the healthy mouth, taking the occasion of the existence of a wound, or a reduction of vitality to colonize the mucosa which would have otherwise remained sound.

TREATMENT:—(Gastro-enteritis canum). In my hands, disinfection of the intestinal tract, with the usual intestinal antiseptics has proved a dismal failure. I would like to state here, that my experience with flushing out the entire alimentary canal, much as it would seem to be indicated, has been absolutely of no avail, and in every instance in which I have employed this method, I have always wished that I had refrained from its use. The patient always seemed to race on to the finish after its use, never seeming to recover from the marked exhaustion following this procedure.

It occurred to me that here was a condition in which the well known Bulgarian bacillus was indicated. The *Bacillus bulgaricus* was first isolated in Massol's laboratory, after which it was brought to the attention of Metchnikoff, who quickly foresaw its possibilities and popularized its use, both as a hygienic aid and a therapeutic agent of vital import. There are two varieties known as Type "A". and Type "B". Type "A" seems to produce better results in a clinical way. Let us dwell for a moment upon the biology of this organism so that we can the better understand it.

The *Bacillus bulgaricus* is one of the lactic-acid ferments, producing a very much higher percentage of lactic-acid than does the ordinary lactic-acid bacillus found in sour milk, therefore, it is capable of withstanding and thriving in a higher percentage of acid which it generates. The true *Bacillus bulgaricus* "A", under favorable conditions produces on an average four per cent of lac-

tic-acid. It is because of its ability to withstand acid, that it is capable of passing through the normal gastric digestion process unharmed. Ordinary lactic-acid bacilli are far less resistant to acid, hence, unless an animal ingesting them is suffering from marked gastric derangement characterized by marked acidity and fermentation, they will be destroyed by the normal Hcl of the gastric juice, and so cannot exert any action in the intestinal canal, which they do not reach alive.

The *Bacillus bulgaricus* will not grow at the ordinary room temperature as do the ordinary common lactic-acid bacilli, but it will grow at the body temperature. The organism does not grow well on the ordinary laboratory media, growing only very sparingly, a fact that unfortunately precludes the possibility of the average veterinarian preparing and maintaing pure cultures.

Lactic-acid therapy has lost favor with a host of physicians, partly because of exaggerated claims made for it, and partly because many of the commercial preparations claiming to be pure cultures of the Bulgarian bacillus have proved utterly worthless. Among the commercial preparations stated by the American Medical Association in its list of "New and Unofficial Remedies", to be practically pure cultures of the *Bacillus bulgaricus* are: 1. Hynson Westcott & Co., Bulgare Tablets; 2. Fairchild Bros. & Froster's Lactampoule; 3. Lederle Antitoxin Laboratories, Massolin. For any others see the pamphlet published by the association. Of the three mentioned, I have used Lederle's preparation, the Hynson Westcott Tablets, and also Tht. Abbott galactenzyme tablets, with equal results.

Dr. J. Favil Biehn, of Chicago, writing upon the *Bacillus bulgaricus* as a therapeutic agent, says of it that it is his main reliance in gastro-enteritis in children. He says, "for five years tablets or galactenzyme bouillon has been my main reliance in the treatment of gastro-enteritis in infants. The children in the cases I have seen varied from three to four and a half years of age. Under ordinary circumstances, as these cases are seen by the average practitioner, the mortality should not be over four per cent when this treatment is employed; in fact, a number of observers have reported several hundred consecutive cases without a single death.

These children not only react to this bacillary treatment very rapidly, but in spite of from four to twenty bowel movements a day they generally continue to gain in weight. Originally, after

an initial purge—preferably of calomel followed by castor oil, or a laxative saline—I placed the sick baby on a starvation-diet for forty-eight hours with the *Bacillus bulgaricus*. Now, however, even in the highly toxic cases, in which the temperature is subnormal, where the patients evidently have little or no reactive vitality remaining, I do not resort to the starvation-diet, but order a continuation of the breast feeding, or of the modified milk, or whatever the child may be receiving; provided the food being given is of the proper kind for the child.

If I prescribe the galactenzyme bouillon (Abbott) it is added directly to the feeding. I believe, however, that equally good results are obtainable from the galactenzyme tablets (Abbott) provided they are not too old, and have been kept in the ice-box, i.e., contain living, viable *Bacillus bulgaricus*. Indeed, it has seemed in some cases that better results followed the use of the tablets than of the bouillon culture."

In the writer's experience with the *Bacillus bulgaricus* in gastro-enteritis hemorrhagica of dogs, I find it best to start right off with the bacillary treatment, omitting any purge and allowing only a milk diet, provided the patient will take it voluntarily. In those cases in which the patient will not even take milk, and most of the cases one gets there is complete inappetence, I just administer from four to six tablets three times daily, and usually inside of thirty-six hours the patient will begin to lap all milk offered him. I also refrain from administering any agent tending to check the bowel movement, depending entirely upon the *Bacillus bulgaricus*, and I find that it seldom fails, and one can bring a dog around in pretty good shape by this method, beyond being very run down and poor in flesh. This can usually be easily rectified and in the course of a week or ten days, under a course of tonic treatment one usually begins to see the semblance of a normal canine again.

Necrotic Stomatitis. The treatment of this condition calls for a very careful nursing, and to my mind this is half the battle. Persistent washing of the mouth with the various antiseptic mouth washes, i.e., potass. permang. 1 per cent; glycothymoline; potass. chloratis; two percent solution of creolin painted on lesions with a brush, swabbing with tannic acid and glycerine, etc. The patient's bowels should be kept acting freely by occasional laxatives. Just as important as the persistent washing of the mouth is the persistent administration of nourishment. I administer eggs and milk,

concentrated beef broth, in small amounts every two or three hours with a syringe and this is a part of the treatment which under no consideration must be neglected.

After the signs of resolution are apparent, i. e., the dog showing desire to lap up fluids of his own accord, one must begin to build the patient up with appropriate tonic remedies.

SUMMARY.

I. It is the writer's wish that the vulgar term, or misnomer, black-tongue, should be dropped once and for all by the veterinary profession, as we have had enough of such, in our present day literature.

II. That in the *Bacillus bulgaricus* we have a very effectual therapeutic agent to combat the condition known as gastro-enteritis hemorrhag. canum.

III. There seems to have been a confusion in the past; two diseased conditions having been, as it were, fused into one, and termed black-tongue.

IV. There is no such condition, as black-tongue in the dog. The condition which has in the past been so diagnosed consists of two distinct and separate conditions, viz., gastro-enteritis hemorrhag. canum, and necrotic stomatitis of dogs.

N. B. In a recent bad case of necrotic stomatitis, the writer made an autogenetic vaccine, and derived great satisfaction from its use, and when occasion arises he will make further trials along these lines and will duly report through the medium of the JOURNAL.

REFERENCES

LAW'S Vety. Med. Vol II.
HUTYRA & MAREK, Vol. I.
SAUNDERS' Canine Med. and Surg.
J. FAVIL BIEHN, A.M., M.D., The Therapeutic Uses of Bulgarian Bacillus.

The nineteenth annual meeting of the Minnesota State Veterinary Medical Association was held at the Merchants Hotel, St. Paul, January 12, 13 and 14, under the presidency of Dr. E. S. Shore of Lake City. The clinic was held at Dr. C. E. Cotton's hospital.

ILLEGAL PRACTICE*

GEORGE J. GOUBEAUD, Flushing, L. I.

The illegal practice of veterinary medicine has reached a stage wherein, in my opinion it is becoming a positive menace, a source of grave danger to the health of the community through the ignorance of the person who attempts to apply a knowledge that he does not possess, thereby endangering the lives of the public through the transmission from animal to man of such diseases as: anthrax, rabies, glanders, tuberculosis, and many others. He does not know of their existence, much less of their presence when they do exist. He is usually the one person who can be thanked for the spread of foot-and-mouth disease, Texas fever and many of the other communicable and transmissible diseases of the animal kingdom, with the resultant loss of animals and their money value.

It is difficult for a lover of the veterinary profession to use temperate language in denouncing this class of common vulture. The quack, the nostrum vender, the patent medicine agent, the prescribing druggist, the dispensing wholesale and retail chemist, the vaccine manufacturer, the stableman doctor, the itinerant horse dentist, the correspondence school graduate, the graduate of the disreputable veterinary college, and the graduate of the reputable veterinary college, who was unable to pass the examination of the State Board of Regents and secure a state license, and the employer of the unlicensed man. And there is still another class of fakers who should not be tolerated, and I believe your attention should be called to them—they are the fake canine specialists, the dog doctor dealer, the adept in stealing and selling stolen dogs. Most all of this class pose as veterinarians. I have not mentioned them all—time forbids it.

This is indeed an appalling array for the prospective student to gaze upon and ask him to join our ranks. It is said that this is an age of competition, and if such be the case, I do not know of any business or profession that has so many illegal, unjust and unscrupulous competitors.

The lay public is led to believe that these men are regularly qualified veterinarians, and if the real danger lay alone in deception,

*Address of the President of the Veterinary Medical Association of New York City, January 5, 1916.

and the consequent fraud that is practiced, I do not think that much danger would result, but the loss inflicted is where the animal is unscientifically, inhumanely, and often times diabolically mistreated. The loss by death and of money value is not the only result, but where a contagious disease exists, it is not recognized until irreparable damage has been done.

The term "quack" has been applied to the illiterate, the charlatan, the humbug and the crook. He is shunned by those who know his qualifications. He is an usurper, in that he takes to himself a title that is not legally or justly his. For ages he has been derided, ridiculed, and the butt of the sarcastic humorist, and at ttmes his brutal and cruel acts upon a poor dumb creature know no limit. He is usually devoid of principle, honor, reason or sentiment. His stock in trade consists of his ability to drink rum, repeat filthy stories, use foul language, steal prescriptions of qualified veterinarians, and scheme how to defraud and beat the law. His brazen indifference of law is amazing.

The native born is not the only offender. The foreigner, who has not as yet lost his sea-legs, swears allegiance to his adopted country with one hand and with the other he is arranging how to beat the law.

The uostrum vender and patent medicine man are an equal danger. Their frauds, willful and often malicious endanger life and property. They are persons who care not what damage is inflicted so long as they receive a profit from the sale of their concoctions.

Laws are being made and enforced that are gradually driving these fakers out of existence. There are millions in their concoctions and they are spending millions not only to avoid existing laws, but to prevent others from being placed upon the statute books.

The prescribing druggist, that semi-professional crook, that avaricious creature, that man who not only disposes of the forbidden drugs, but has been selling drugs that will not only kill the innocent, but the victim as well. He will renew your prescriptions when you forbid it. He delights in the profits derived by the sale of compounds, the knowledge of the ingredients he is stealing from some veterinarian. He will stock a stableman's medicine chest, and he affects to be offended when you question his right. He will dispense without qualm the most dangerous drugs and when called to

account, he will tell you that if he does not do it, someone else will. Some of the wholesale chemists and vaccine manufacturers are in the same class. They will sell to anyone who desires to buy irrespective of the consequences. The veterinarian who is employed by them or associated with them is no better. The veterinarian who from his college days to the day that he begins life as a full fledged professional man has been taught by precept and example, professional courtesy and honor. The code of ethics is being observed by the better element and the foremost leaders of the profession. As time advances he develops a fondness for the hidden mysteries in the bacteriological field; by study, by personal investigation and experimentation, he has discovered and developed through the aid of other veterinarians a serological form of treatment for certain contagious diseases and by the aid of his professional brothers he is enabled to place before the public a treatment that has some merit. No sooner has the treatment met with approval, than he proceeds forthwith to sell the remedy to anyone who has the price. He cares not whether his serum is injected into a glandered horse or a tuberculous cow. He forgets and does not care about the self-sacrifice of the men who taught him and the men who helped make possible the existence of his treatment. He commercializes the product. The result—he becomes careless in the preparation of his serum, foreign organisms gain entrance into this biologic product, and what follows is an outbreak of some contagious disease. The hypodermic syringe and the biologic material are responsible for more damage than we are aware of. You are doubtless aware of the outbreaks that have been caused by the introduction of some of these sera.

The unscrupulous manufacturers are the first to ask our aid, and having secured it, they are the first to become our enemies, and when the damage has been inflicted, they will again seek our assistance, only to repeat their contemptible acts at the first opportunity.

The stableman doctor—you all know him, and I am sorry to say we are in a measure responsible for his existence. The damage that he has inflicted, is in my opinion, equal to the damage caused by diseases. He usually does not possess the rudiments of a common school education, much less a scientific training. He is a most dangerous and expensive possession. My last experience was in a stable containing 23 horses, 21 of which were suffering from glanders

(12 of these were clinical cases). These men are most cunning and they will resort to any trick to hoodwink their employers as well as the veterinarian. We all know this. We all know that we will be sent for at the last moment and when the animal dies, the stableman will inform the owner that the doctor could not do any more than he did, and the owner believes him for he does not take time to investigate, nor do we take the trouble to notify the owner of the true conditions, and the stableman gets away with it at our expense. It is most amusing to listen to the statements of shrewd and able business men concerning the veterinary ability of their stablemen. It is surprising the amount of culpable ignorance they develop in this respect. Their favorite statement is that "My man has been around horses all his life—he knows all about them, and that is the reason I never need a doctor—he was raised with horses." One made this statement to me, and to prove its correctness, he brought me into his stable, which contained 50 horses. He asked me to look them over. I did. I picked out three cases of clinical glanders. One horse had setons in his shoulder, and his hoof upon the same leg was sloughing off, the result of a punctured wound. I also knew that he had three children and that they had diphtheria. When I was leaving the stable, I asked him how his children were and if the housekeeper was treating his family. Suffice it to say I was not employed to treat this man's horses, but another veterinarian was.

I feel that we must tolerate stablemen, but by no means encourage them. The itinerant horse dentist is another fake. He comes the nearest to being a clown and a sleight of hand performer than anything I know of. He is certainly a spell binder. He will operate upon a tooth of a horse that needs no operation. He will extract teeth that are sound and substitute a most odoriferously decayed molar with the expertness of a sleight of hand performer.

The correspondence school graduate is another class. He is usually a man seeking a short road to success, and the institution that encourages him is criminal. The poor deluded, misguided creature needs enlightenment and our sympathy, and I believe that the institution which humbugs this class of poor simpletons should be put out of existence.

The next in order in the class of fakers is the fake canine specialist, the dog doctor dealer, the adept in stealing and selling stolen dogs. Most of this class pose as veterinarians. Their stock in

trade consists in their ability to be guilty of dishonorable acts; to talk dog talk with the ability that would put a race track tout to shame. They are supplied with a hypodermic syringe, distemper vaccine and a case of tablets, guaranteed to cure any and every disease that a dog suffers from, and a pair of ear cutters.

The veterinarian is again responsible to a certain degree for the existence of this creature. He is responsible because he has in a certain measure taught him a few rudiments. He has advised him to employ some of the agents which are not found in the nostrum of the proprietary medicines.

This dog fake specialist usually employs a veterinarian to perform his operations. He pays the veterinarian for his services—he dresses the animal's wounds himself, charges the entire bill to the owner of the dog with the understanding that he is the one who has performed the operation; that he is qualified to perform operations and that he is a full fledged veterinarian. I am sorry to say that some of the veterinarians know this and they are perfectly satisfied to allow an usurper to take credit for the work which they perform and they do not care about the result or effect it will have upon the public as long as they are paid for the operation.

The graduate of the disreputable veterinary college is another class. The institution which grants him a diploma, is at best a fake and a humbug. It bears little semblance to decency and its faculty is no better. All that is desired is a candidate—the next the money. The school cares not to what depths it attempts to drag the profession. It has lost all feeling of self-respect and decency. It desires not to impart knowledge, it cares not to what humiliation its students and graduates are subjected. It is deaf to appeals and it will continue until an aroused public sentiment demands that it close its doors.

And the unlicensed graduate, who cannot and who in defiance of the law will not take the state examination is another class. He is equipped to a certain degree, but his requirements have not been completed, and at a time that he should show by his conduct that he is entitled to practice, is the time that he flunks. He will engage in practice in defiance of the law, or he will hire himself out as an assistant, which he usually does. He knows that he cannot legally report cases; he knows that he cannot hold positions under the civil service; he knows that he is unjustly competing with legalized, qualified men; he knows that he engages in an unfair compe-

tition; he knows that every act of his while performing professional duties is in violation of the law, and still he continues in his defiant and lllegal course, and I am sorry to say that he is encouraged by some of the legalized, qualified practitioners, who employ him. Some of these encourage him in not taking the examination, and they know why; they ridicule the law to their illegal assistant—and they know why; and they know that the law protects them and not their assistants, and they know that they cannot afford, or will not pay, the salary to a competent, qualified assistant. Their practice will not afford it, or they are too miserably cheap to pay a decent sum, or they are afraid of a legalized, qualified man. They are fearful, lest after he has saved sufficient to start in practice for himself, that he may open an office and begin his professional career in opposition to his employer. They know that a successful practitioner must have a personality that is taking with the public as well as scientific ability, and they are afraid lest their assistants develop this to the detriment of the employer. They know these things and they still further know they are guilty of illegal, unjust and unfair, if not unscrupulous acts. They know the ability of the assistant and they also know of the illegal standing of that employee. They mock and ridicule the law all in the presence of of the assistant, and in their hearts they know why. Some of them will fly into a fit of rage and denounce anybody charged with the enforcement of the law, and they will threaten to go personally to Albany and have the law changed, and they also know why, and if the law could be changed, it would be for their own individual benefit. Some of these employers claim the law is unjust. They will state that their assistants do not engage in general practice, and again they know that this is not so. They know that no just or liberal practitioner objects to an assistant who accompanies his employer, dresses wounds, dispenses medicines, and does the nurse's work. There is no valid objection to an illegal assistant performing nurses work and the employer is aware of this. We are all aware of it, and I do not know that we as a body object, but what is objected to is that an employer sends out his non-registered assistant to engage in general practice in competition with a registered man. He knows that he does not employ the assistant as a nurse, but to engage in general practice. Some of the assistants develop expertness in a few instances, and their employer is very deficient in these individual cases. He uses the assistant to perform these operations

and the money derived more than pays the salary. A case in view will illustrate the point I wish to make. I know of a veterinarian who employed an unlicensed assistant. This assistant had little ability, but he possessed a knack in handling a vicious dog. By continuous application he became an expert in ovariotomy in cats and dogs.

The employer had a mortal fear of a dog. He would put a cat to shame climbing a telegraph pole in his efforts to escape the harmless toothless pup. He knew that his assistant had absolutely no fear of the dog and he knew that his clients rather favored his assistant. He did not care. His assistant made the money out of canine practice, which more than paid his salary. He also had the assistant do other work, such as night calls, urgent calls, clerking, bookkeeping, janitor and driver service. He knew that he would not have any canine or feline practice if it were not for his assistant, and he also knew that when his assistant left him he would lose his dog and cat practice. He was everlastingly ridiculing the law, as well as defying it. He continually urged his assistant not to take the state examination. He knew why he did these things—the result was that the assistant became discouraged at his position, circumstances arose that compelled him to take the state examination—the result—he has left his employer and has built up a nice paying practice; his employer has no assistant and has no canine practice to speak of, and is still engaged in general practice. This is not an exception. I can cite any number, and so can you.

The practitioner who employs a non-registered or an illegal assistant shows an utter contempt and disregard for the hardships and the ambitions of the young practitioner. He forgets the time when he did not have the price of a week's board and did not know where to get it. He does not remember the time when he was notified that his rent was past due. He does not remember the time when he was to receive a dispossess notice. His only possession was a scientific training, a hustling ability and taking personality.

Illegal practitioners met him everywhere, the leading members of the profession saw that this ambitious, worthy young man was being handicapped by his illegal and unscientific competitors. They framed and had passed laws that protected him. Expenses were incurred in having a law passed, and his only subscription was the "widow's mite". The framers of the law asked nothing

from him, but that he be straight. The law was passed and he grew fat under its protection. His legal standing gained him a position that he could defend, and by attending to his practice, and he stuck close to it, as did the proverbial leech. He sought the friendship and acquaintance of men whom he thought would be of assistance to him. He denied himself the pleasures and recreation of life, lest by his absence he lose a call. Instructions were given by him to his friends where to find him in case his services were required and wherever he was needed, he could be communicated with immediately. He was never known to lose a call, and he never lost an opportunity to secure a prospective client, and as time advanced he built up a practice that demanded help, and he forthwith proceeded to employ an illegal practitioner. He has lost his memory, his high ideals have been cast to the winds. He forgets the laws that were passed for his benefit. He denounced injustice once, but he cares not about justice now. He bemoaned his position once, but he is on easy street now. He mocks and ridicules the law that gave him a standing; he cares not for the suffering, hardship, injustice and humiliation he inflicts upon others. He is deaf and blind, but not dumb. Just accuse him of these acts; just call these facts to his attention, and he will denounce you most vigorously. His audacity is amazing and his reasons are as illogical as are his illegal acts.

The employer of a non-registered man defies the law and he knows it, and he also knows that an accomplice in the commission of an offense is equally guilty, and he knows that he is guilty, and he will continue in his way of law breaking, but let someone injure him in the same manner as he has injured others. How quickly he will invoke the law that he continually breaks.

Now gentlemen, to sum up—these conditions exist and they will continue to exist until some drastic action is taken and the law enforced, and when it is enforced, which I hope will be soon, let us see to it that there are no repetitions. We have it in our power to enforce the law and let us all pull together and do so.

The Western Pennsylvania Veterinary Club, with Dr. Fred Weitzel of Pittsburgh as secretary, has been organized to supersede the Western Pennsylvania Veterinary Medical Association.

VETERINARY PREPAREDNESS

R. VANS AGNEW, Veterinarian 5th Cavalry,
Fort Leavenworth, Kansas.

As almost every stratum in society in our country is taking up the question of preparedness in a serious frame of mind, either for or against that state; it is time that the 14,000 veterinary surgeons of the United States should look at the question as it particularly affects them, and still more especially must the A. V. M. Association, for it is the organized part of the whole body. Therefore it can prepare to a useful degree from the very start of war if that unfortunately happened.

No veterinarian can look back with pride on the organization of the veterinary department during the insignificant Spanish and Philippine wars: but with that failure to spur us on, we must not be found wanting in the next war.

It is a question of organization: to get which we must first know what we will require; the next thing is to acquire it; lastly, if we are called upon, to perform each his part with his utmost ability.

There is no better proof of a good organization than in the fact that it is elastic and in sudden emergencies can be promptly and rapidly enlarged to meet them, consequently, with our small army we must develop our schemes of preparedness very thoroughly with a view to a sudden and enormous expansion that will have to be met with order and efficiency.

It is my intention to give to the A. V. M. Association a general idea of what would be required of us in war times. To begin, our army at present has only 15 regiments of cavalry and six of field artillery. There are two veterinarians to each regiment, making 42 in all. This is in our supposed army of 100,000 men.

Superficial reading of newspapers on the war in Europe gives one the impression that cavalry is no longer an effective arm of the service and therefore will not be used, and that motor power has driven the horse and mule out of the war game as a draft animal. To offset that we read that about 300,000 horses and mules have been bought in this country during the last 18 months and are still being bought by European nations to use for war purposes, also in "The Field" an English paper, on "Horses in the War" that "since the beginning of the war more than 100,000 horses have

passed through the hospitals." This is on the British side alone.

If we take the French, German, Austrian and Russian figures at an approximate *pro rata* number of horses used by each nation, we can safely say that nearly a million will have been wounded or killed in this war.

The only section in the battle line in Europe where cavalry is not being extensively used is on the western side in France and Belgium, owing to the smallness of the country. On the eastern front cavalry is freely used and in our vast country this would also happen for we would be able to manoeuver as much cavalry as we wished. Anyhow we can make up our minds that huge numbers of horses would be used by us in our next war.

One thing this present war has brought out is the need of enormous quantities of guns that are mobile in character and can be shifted about quickly and easily, so we can look for a very large increase in field artillery to offset the contemplated decrease in cavalry, which means that the same, if not a greater number of horses will be needed. Our present army has 21 regiments using 42 veterinarians, supposing it was suddenly increased to 150 regiments requiring 300 veterinarians for the regiments alone and probably 400 more for our first army purposes, and these 700 men wanted inside of a week. That would be the situation to say nothing of the equipment and medicines to be collected at the same time.

As the ruling body of our profession in America, it is surely up to the A. V. M. A. to take this matter up seriously and draft a well organized and elastic scheme whereby it can put proper and competent men into any and all positions that the government may call on the veterinary profession to fill in time of war.

At present the quartermaster department is in charge of the remount system; the buying and issuing of all veterinary supplies and the employing of civilian veterinarians in time of war; this it is needless to say is not in agreement with the ideas of the army veterinarians or of any medically taught man who has to receive lay orders on his own profession. Consequently our army veterinary organization is poor and in time of war it proved so top-heavy as to be very expensive and fairly worthless. It will continue so until the authorities learn that the indispensable condition of efficiency in peace or war is *responsibility*.

However, it is the present system and we must make the best of it and aid it as much as possible.

Our remount system was very small before the civil war and was handled by the quartermaster's department which continued to do so for the first two years of hostilities. But the service proved so unsatisfactory that on July 28th, 1863, General Stoneman was made chief of a cavalry bureau to take charge of it, and depots were established at St. Louis, Mo.; Nashville, Tenn.; Harrisburg, Penn.; Wilmington, Del.; and Giesborough, Md.

Details of the depot at Giesborough are most instructive. It comprised 625 acres; five thousand men were employed in its construction and after completion there were 1500 regular employees. It was started in August, 1863. Within three months the capacity of the plant was 15,000 head and by February, 1864 was increased to 30,000 head; though the greatest number of animals kept there never exceeded 21,000 head.

The veterinary hospital had a capacity of 2,650, the stables 6,000 and the sheds 10,000. The yards and corrals covered 45 acres. The total estimated cost of the whole depot was $1,225,000.00. One can gain some idea of the extent of the work done at the depot.

On hand January 1, 1864	15,721
Received by purchase Jan. 1, 1864 to June 30, 1866	5,326
Received from other depots for issue	59,507
Received for recuperation	85,980
Received by transfer from artillery	4,120
Total	170,654

Issued to troops in the field	96,006
Issued to officers after June 30, 1865	1,574
Issued for sale or sold at department	48,721
Died	24,321
On hand June 30, 1866	32
Total	170,654

In this report the enormous number of deaths strikes one very forcibly but can be partially accounted for by a lack of knowledge and sanitation in those days. This depot handled in all about 210,000 animals, the greater part of which were sent to the troops of the army of the Potomac.

This one depot will give us some idea of the vast number of

animals needed by an army of approximately one million men in those days, and the same number and even more will be needed in the present or future wars. The cavalry bureau was finally merged into the Q. M. department about January 1, 1865.

In 1908 the Q. M. General started the present system of remount depots. The first one at Ft. Reno, Okla., comprising 10,000 acres with necessary buildings and feeding capacity for 2,000 to 3,000 head. The second one at Fort Keogh, Mont., comprising 100,000 acres and necessary buildings and with feeding capacity for 4,000 head. The third one at Fort Royal, Va., comprising 5,000 acres with the necessary buildings and feeding capacity for 1,200 to 2,500 head.

In time of war these depots could be capable of very large expansion, but their usefulness would depend largely upon the power or powers we would be fighting against and the situation of the battle fronts. Anyhow we would require at least two other depots and possibly three with a capacity of 25,000 animals in each of the six places.

These animals will have to be received, inspected, isolated, treated, properly fed and watered, and shipped out sound and fit for service, calling for large veterinary hospitals, stables, isolation hospitals, sanitary surroundings, proper feed and good water, all of which will have to be overseen by veterinarians and many of them. These depots are just the receiving stations and do not come in contact with the armies in the field.

In the field the veterinary service could be arranged so as to be mobile in character at the extreme front, gradually getting more stationary on the lines of communication towards the military base.

To every division of infantry (about 7,500 animals) and every brigade of cavalry (about 3,000 animals) is attached one veterinarian and 25 well trained horsemen. These men should have had some training in farriery work such as they would get around veterinary hospitals in civil life and also discharged farriers from the army. They should be all mounted and equipped with necessary veterinary supplies in order to come up behind when an army is on the move or after a fight, to collect the wounded animals, examine and first aid them and arrange for their transfer to the rear to the field hospitals, thus relieving the regimental aid stations of severe cases and inefficient animals. Roughly speaking it would

require 500 veterinarians and 3,000 veterinary men to carry out this scheme in an army of 500,000 troops.

To give some idea of the value of an efficient veterinary corps, these figures are taken from "The Field," an English paper, and are from the report of the Secretary of the R. S. P. C. A., on some results of the English Army Veterinary Corps: "The total number of animals treated in hospitals to last August was 81,134. Of these 47,192 were returned to remounts as cured, 4,266 died, 4,843 were destroyed and 1,842 were cast and sold. Beyond these 22,991 remained in the hospitals and at the convalescent horse depot."

Practically more than 100,000 horses were treated in the hospitals during 11 months of a war in which cavalry was only used as a fighting arm for a few months and motor transportation is supposed to have superseded the draft animal, and this in an army of about 200,000. No wonder that we have to take this matter up seriously when we think of the hundreds of thousands of dollars we can save the country by effective arrangements, and also save wounded and sick horses besides increasing the striking power of our armies.

If the government knew where it could immediately employ 1,000 good veterinary surgeons who have studied over, and for these conditions and in many cases have done enough field work to gain some idea of what would be required in the army, it would probably turn our work over to us and give us a chance to prove our responsibility in the matter.

At the start of a war veterinarians will be wanted for meat inspection; hay and grain inspection; buying and inoculating horses; buying veterinary medicines and supplies; remount stations; convalescent depots; inspection of horse-shoeing and army field work. All these subjects except the army field work are to a great extent well known to the members of the A. V. M. A., but each man can perfect himself a little more in them if he intends to join his country's army in time of war and many can do the field work if they wish. There are national guard troops of cavalry and artillery, and there are U. S. troops of cavalry and artillery scattered over the United States and I am sure that veterinarians could arrange to join these troops on their practice marches each year. Any army veterinarian would gladly help. For instance, here at Fort Leavenworth, Kansas, there are four troops of cavalry. In 1915

each troop made a practice march of three days and the squadron (or whole four troops) made three marches, making seven marches in all, and they will no doubt have these this summer of 1916.

I am very positive that arrangements can be made to take one veterinarian along with each troop and four veterinarians when the squadron marches; this would accommodate 16 veterinarians and the same could be done elsewhere. Speaking personally I would say that if any veterinarian wishes to take advantage of this offer I will be only too glad to arrange it for him and can guarantee that he will be given a good time in every way by the officers of the second squadron of the fifth cavalry.

In this manner a great many veterinary surgeons will understand field conditions, etc. in the army, and these are the most useful to know in war time, also they will learn that riding a horse is an indispensable accomplishment and that resourcefulness under adverse conditions is the true test of a man's knowledge; laboratory knowledge solely is not enough. This article is merely tentative, it is for the purpose of bringing before you a general idea of what should be done and what is needed to do it. But there is no doubt that it should go further than the experimental stage and that a committee of members of the A. V. M. A. should be formed in order that the association may eventually be able to afford the war department precise knowledge of the number of veterinarians who can immediately take up the different specialized lines of work that each one is most competent to perform when summoned.

Definite collaboration and aid from the S. P. C. A. will have to be arranged. In the meantime it is earnestly requested that members will give this subject consideration and collect concrete ideas about it so that by August 22nd in Detroit we shall have something definite to work on.

An acceptance by the government of our plan of service will increase our professional status and raise our moral status, in that every man would feel a personal pride in being really useful to his country in her need.

The Idaho Association of Veterinary Graduates will hold their next regular annual meeting at Blackfoot, Idaho on February 3 and 4. A good program and banquet are planned, also a good clinic at Drs. White and Williams' new veterinary infirmary.

MUNICIPAL MEAT INSPECTION*

A. E. MERRY, Syracuse, N. Y.

At the different meetings of this society there have been papers read upon the subject of meat inspection, and discussions following which have played a very important part in arousing public interest in securing in this city a meat inspection ordinance which was passed by the common council in July, 1913. Briefly, however, I will attempt to give you the more important working points of the ordinance, and a few of the results which have attended our use of it.

The first requirement of the ordinance is the appointment of a veterinarian and two assistants whose duty it would be to enforce it.

All meat which is brought into Syracuse must be presented for inspection and be stamped except that which has been inspected and stamped by the Bureau of Animal Industry, state or municipality which maintains a system of post-mortem inspection and marking equal to the standard maintained by the city of Syracuse.

The ordinance also calls for a license in each slaughter house and market within the city limits, and this license is not to be granted until such slaughter house or market conforms to the requirements of this ordinance. It also restricts the hours of killing or slaughtering of animals within the city limits. It provides for the construction, sanitary conditions and equipment of such places and the health of the people or persons employed therein.

This ordinance was to have been put into operation January 1, 1914, but due to the objection and strenuous opposition on the part of butchers and meat men, who were desirous of rescinding it, matters were delayed for a considerable length of time. However, provision was made in the budget for 1914 for the appointment of the required number of inspectors, and a number of meetings of the health committee of the common council were held to give the butchers and meat men an opportunity to offer their objections to the ordinance. After considerable time had been spent, it was found that their chief objection was to the term "license" being used and that they would be perfectly willing to submit to the term "permit" instead. This point was granted, inspectors

*Presented at the meeting of the Central New York Veterinary Medical Association, November, 1915, Syracuse, N. Y.

were appointed and began work April 1, 1914; a motorcycle being provided as a conveyance to be used in reaching country slaughter houses, and a system of stamps and report blanks was worked out and provided.

As we had no stamping station, we tried the system of inspecting the meats after they had been delivered to the markets and before they were offered for sale in the markets. During the remaining nine months of the year there were 7,589 carcasses inspected at slaughter houses, and 12,471 carcasses inspected in the markets and on the streets; or a total of 20,060 carcasses, out of which 15,000 pounds of meat were condemned.

Shortly after January 1, 1915, it was decided to use as stamping stations our two public markets, one located on the north side and one on the south side, and since then the butchers and farmers have been required to drive to either of these places where inspectors have been stationed during the hot weather from 7 until 10 A. M., and in cooler weather from 8 until 11 A. M.

During the first nine months of this year 7,529 carcasses have been inspected in the slaughter houses and 17,394 carcasses inspected at these stations; a total of 24,923, out of which 34,054 pounds of meat have been condemned. So that in eighteen months of inspection nearly 25 tons of meat have been condemned and confiscated.

From time to time violations have been discovered and in a few cases arrests have been made where we had proof and evidence sufficient to obtain a conviction. On one occasion the pleura was stripped or peeled, removing the tuberculous lesions from the ribs of an infected animal and when the carcass was detected in the market the butcher who had placed it there pleaded guilty and a fine of $25.00 was imposed by the court.

On another occasion a man was arrested upon the warrant of an inspector for having bob veal in his possession within the city limits. But in this case the jury disagreed.

Another case where a man was found delivering bob veal to a meat market, upon being arrested pleaded guilty and was fined $50.00.

This perhaps has had its effect upon certain persons engaged in the business, and now in a majority of cases when a butcher finds that he has a generalized case of tuberculosis, he either buries the same or carries it to one of the rendering tanks. We are bothered very little with immature veal.

On the whole we feel that the butchers have co-operated remarkably well and in the majority of cases they seem as anxious as the city to have their meats and sanitary conditions right.

At the present time we are lending our efforts to obtaining a suitable stamping station and a year from now we hope to be able to offer for your inspection a fully equipped stamping station.

An inspector goes to the meat markets every afternoon to look over the condition of the meats on hand, to see that they are stamped and also take in the sanitary conditions of the markets. The markets in the outlying sections of the city have been painted and the interior of the coolers in all sections of the city have been shellaced and a large percentage of them white enameled. We found that shellac could be used during the warm weather when the meat was in the cooler, one side of the cooler being shellaced while the meat hung on the other side, and that shellac made a very good sub-coat for the white enamel.

I want to take this opportunity to extend to all of you an invitation to visit us at any time and look over our system and offer any suggestions which you may have and which may be of advantage to us.

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LIVE STOCK AND VETERINARY CONDITIONS IN GEORGIA*

DR. E. M. NIGHBERT
Of the United States Bureau of Animal Industry.
Inspector in charge of eradicating Cattle Ticks in the States of Georgia and Florida. Atlanta, Ga.

In my invitation to attend this meeting it was stated that I might present the subject of eradicating cattle ticks or any other subject I desired; therefore, in addition to that subject I wish to present in a brief way some of the things I think important to the veterinary profession, especially in this state. It was noted that your program carried among scientific subjects the lay subject, "Veterinary Practice by Farm Demonstration Agents"; this will be touched upon later in this paper.

*Address before the Georgia State Veterinary Association, Macon, Georgia, October 26, 1915.

Eradicating the cattle ticks in Georgia is the first step in clearing the way for a profitable cattle industry. It is a co-operative work; therefore we are co-operating with your state veterinarian, upon whom rests the responsibility of carrying on this work for the state. The efforts of one man are insufficient in this movement, however, so county officials, farmers and business men are required also to co-operate along certain systematic lines. The work began in 1906, and has made satisfactory headway, resulting in freeing nearly one-third of the state from this serious menace to the cattle industry. Completion of the work will be of much value to the farming and business interests. Improved sires and herds are being introduced in the area freed of infection for the purpose of improving the native cattle. The cotton farmer being a beginner along this line of maintaining improved cattle and other live stock on the farm, necessarily will seek advice and suggestions for his guidance and protection. Naturally the veterinarian will be expected to render valuable services.

In 1899 the state enacted its first law for the protection of live stock against the spread of disease. It applied only to the diseases of cattle, especially to the spread of the cattle fever tick. This law attracted but little attention and interest until 1906, when the general campaign of tick eradication was inaugurated. Since the establishment of this act general improvement in the way of more adequate laws for the protection and fostering of a great live stock industry, to which the state is especially suited, has been made effective. Recently, additional acts with regard to dairies, slaughtering, abbatoirs, meat inspection, markets, and pure food have become effective, including an act to regulate the practice of veterinary medicine and surgery in the state. Naturally the veterinarian is interested and will assume a prominent part in carrying out certain phases of these laws, which are for the protection of public health and live ctock against the spread of disease. Therefore, the profession today bears a greater responsibility and relationship to modern progress along economic agricultural lines, public health, and live stock sanitation than ever before. The responsibilities of the profession are greater year by year, requiring higher education, experience, and practical knowledge of present-day conditions.

The live stock of this country is worth today nearly six billion dollars. Notwithstanding all the motor-driven vehicles, there are more horses and mules on our farms today than there ever were,

Cattle are increasing in numbers and value; this condition also applies to hogs. With the country growing older and no new continents to be discovered and converted into farms, and the population increasing, we must make the best of what is here before us. Therefore, diligent study of the great live stock industry in health and disease must continue, that the industry may be fostered, encouraged, and protected.

THE VETERINARY PRACTITIONER. I believe and know that the veterinary profession is equal to the demands to which it is subjected. In my experience of several years actively engaged as a veterinarian I find the profession as a whole equally qualified and as reputable as any other body of scientific men in this country. Their opportunities are varied and difficult of accomplishment, but they have been taken advantage of in a scientific and professional way that has been of great service to the public. It must be kept in mind that all professions have their full share of men of questionable motives. To illustrate, please allow me to make a brief comparison: note what has been revealed since the recent federal narcotic law has been in effect with reference to the unscrupulous physician; note what has recently been revealed within the borders of this state concerning the unscrupulous lawyer, all of which are well known to you. I am not venturing a criticism; these instances are merely mentioned to indicate the importance of keeping such conditions in the veterinary profession reduced to the minimum, which may be accomplished through your organization. No profession should be judged or criticised as a result of the action of a few. I have seen your membership increased from a few to your present body of over fifty men. To-day you are recognized as an important agency in the state and are in a position to aid in the systematic plan to develop a live stock industry. You realize, I am sure, the importance of live stock in connection with cotton farming.

The State Agricultural College, established during the past seven years, is the main factor in fitting men for proper live stock breeding required in connection with modern methods of carrying on farming operations to suit present-day conditions. The veterinarian is likely to overlook the importance of a practical knowledge of the soil and crops of his territory, when, in fact, he should acquaint himself with all the things that affect the farming interests in order that he may be able to discuss them accurately. There-

fore, I believe the veterinarian should make it a point to attend the farmers' meetings and become acquainted with all the local live stock conditions. He should continue his study of feeds and feeding, live stock breeding, and marketing, and make it a point to attend the Farmers' Short Course at the college. By so doing he will soon become a factor in modern things agriculturally in his community.

VETERINARY PRACTICE BY FARM DEMONSTRATION AGENTS. This is a day of organization and concentrated action in order to get things done; therefore, I wish to say in connection with the subject of "Veterinary practice by Farm Demonstration Agents," that the farm demonstrator is a representative of the United States Department of Agriculture, or of the State College of Agriculture, or some other agricultural agency interested in the development of farm resources. In fact, he may be considered an envoy sent to negotiate with farmers with the view of doing certain things. He may not be a scientific expert or trained professionally along the many lines of his work. In reality I believe he is intended to be more than that, because he is supposed to possess all the qualities of a practical man with a working knowledge of the needs of his territory and the ability to introduce and demonstrate practical and permanent farming methods. In addition, he is in a position to put his clientele in touch with the proper divisions of state and federal agencies, when subjects not thoroughly understood confront him. I believe you will find the farm demonstrator a good man to become acquainted with. I believe you should cultivate his interest and co-operation, although perhaps it is possible that he, as well as other laymen, may at times assume responsibilities along the line of veterinary practice which are greater than his knowledge or qualifications would permit.

In conclusion, the great struggle of mankind has been to reach the point of understanding diseases and other natural conditions that hindered his legitimate progress. State governments and education have given the people this opportunity. The great propaganda of education has in a large measure pushed aside ignorance, superstition, and prejudice. Education is always followed by scientific advancement, and man is decidedly the beneficiary. The present methods of dealing with the ailments and infectious diseases of live stock are the best human skill and mind have to offer, nevertheless new conditions will continually confront us, and

we shall always have use for all the knowledge that can possibly be obtained along the lines of our work. The veterinarian should keep in touch and co-operate with all state and goverment agricultural agencies; study everything modern possible along his line of wark; be broad and liberal as a man and professionally; and make this association a live one and a greater factor in fostering and encouraging public enlightenment and better scientific knowledge among its members. So will the veterinary profession continue to advance and remain in the ranks as one of the leading professions now serving the people.

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REPORTS OF CASES

INTESTINAL OBSTRUCTION BY A STONE IN A DOG

ROBERT W. ELLIS, New York, N. Y.

The value of high enemas in stoppage of the bowel is pretty generally appreciated by veterinarians—in both large and small animals—as well as by physicians in human patients. The writer, like many others, can recall many instances where it has been the only means of relief, and submits the following case as an example of what is frequently met in canine patients, and as an exemplification of the value of this mechanical form of treatment in contradistinction to the futility of the administration of medicinal agents per orem in such conditions. A dachshund (female) two and one-half years old, was brought to the office for treatment, with a history of not having eaten anything for eight days, and having been vomiting persistently,—especially after drinking,—during that period of time. There was some uncertainty about the bowel movements, but the owner "did not think there had been a movement for a few days."

A diagnosis of stoppage of the bowels was made, a high enema given, also a cathartic administered; although there was very little hope of the patient retaining it.

Vomiting soon occurred, at which time, in addition to the medicine administered, a foul-smelling material, closely resembling soft fecal matter, was brought up.

Mechanical obstruction was suspected as the cause of the stoppage and the suspicion fully explained to the owner who after a careful mind-searching, recalled the fact that the dog had swallowed a stone nine days previously; the day before the loss of appetite and vomiting had been noticed.

Instructions were then given the owner to persist with the high enemas, as it was the only form of treatment from which relief could be hoped; it being explained that medicinal agents of any kind would not remain in the stomach so long as the passage beyond that organ was blocked.

The dog was very weak from eight days' fasting, to say nothing of the exhausting effect of the vomiting, and the owner was pretty low spirited; but accepted the situation and faithfully continued the high enemas of hot soap-water, to which a small quantity of glycerine was added, twice daily, which finally resulted on the third day, in the passage of an irregularly shaped stone, measuring three inches in circumference and weighing half an ounce.

The equipment for the high enemas consisted of a rubber tube seventeen inches long and one-fourth inch in diameter, regular catheter tip one end. The opposite, or open end, was slipped over the rectal tip attached to an ordinary fountain syringe. The tube well soaped, was passed in a little way before the flow was started, then gradually advanced until sixteen inches of its length had entered the intestinal tract. Each flooding brought out something, but no relief was obtained until the stone came down, when immediate improvement in the dog's spirits and condition generally, was noticed, with a cessation of the vomiting, and the following day the appetite returned.

To summarize, the dog swallowed the stone on the 9th day of the month, stopped eating on the 10th, began vomiting on the 11th, was brought in for treatment on the 18th, (nine days after swallowing the stone), passed the stone on the 21st, (after three days treatment) and began eating on the 22nd.

The stone remained in the dog's alimentary tract twelve days and she fasted that length of time.

RUPTURE OF THE DIAPHRAGM WITH RECOVERY

WALTER M. PENDERGAST, Syracuse, N. Y.

On August 2 at 8 P. M. was called to see a large black horse which the owner said had colic. Found the animal down in the stall, sweating profusely.

HISTORY. This horse had worked in a team on a sewer excavation all day. He ate his feed at 6 P. M. and was found down in his stall at 8 P. M.

SYMPTOMS. Patient seemed to be in considerable pain. He would lie down and stretch out on his side and occasionally would sit on his haunches. Respirations were about thirty and were short and labored; pulse 60. Peristalis was quite active with no sign of bloat. Rectal exploration did not disclose much except that the intestines seemed to be farther forward.

Gave him one grain arecolin and one ounce chloral hydrate. obtained good action from the arecolin and the chloral seemed to quiet him to a certain extent. Repeated this treatment in two hours. Patient showed more or less pain all night. On the following morning the animal was still in some pain but not so acute. The respirations were very short and labored, temperature 103°. Up until this time I was at a loss to know what the trouble was, but the manner of his breathing led me to suspect a rupture of the diaphraghm. On auscultation a distinct rumble of the intestines could be made out extending almost to the point of the elbow on the right side. I informed the owner that I suspected a ruptured diaphragm and that the animal would probably die. I had given him ½ oz. aloin on my first visit and on August 1st the patient was purging freely. On August 2nd the patient was free from pain and began to eat a little. He still had that short labored breathing and there was a slight edema between the front legs. The patient continued to improve until August 7th when I discontinued my visits. The patient was given absolute rest for six weeks and was gradually put to work again. He had a slight attack of colic about October 1st but not enough to warrant calling a doctor.

PARTURIENT FEVER?

THOMAS A. ALLEN, Brockville, Canada.

On November 12th I was called to see a Holstein heifer, aged two years and reported to have been five months with calf.

The symptoms presented indicated acute indigestion and possibly caused by an over-feed of meal or ensilage. I applied the usual treatment in such cases with good results.

By the 19th all untoward symptoms had entirely disappeared. On the morning of the 20th, 7 A. M., no unfavorable symptoms were apparent to the attendant, but when he returned to give the noon feed he was greatly surprised to find his patient completely prostrated and in his opinion in a dying condition. I arrived about 12:30 P. M., and found the patient lying on the left side, head and limbs stretched out, head twisted over and partly resting on the opposite side; mouth open; tongue protruding; eyes glassy and entirely without sensation; temperature sub-normal; pulse indistinct; no motion in limbs or head, and when rolled up on the sternum the head flopped over on the right side; in doing so exhibiting that peculiar kink in the neck.

I first gave a hypodermic injection of strychnine, then tried to administer a stimulant but found it impossible as it caused symptoms of strangulation. By this time I was satisfied that I had a well marked, typical case of parturient fever, and at once gave the milk fever air treatment.

I left my patient well propped up and in good hands. I returned at 5:30 P. M. and found a decided improvement and lying on the right side; the attendant informed me that she turned over without assistance; lying on the sternum; head held up at times; ears moving as though warding off flies and the eyes becoming sensitive to touch.

I repeated the strychnine and reinflated the udder, then left for my office.

On my return the next morning, 9 A. M., I found to all appearances a perfectly healthy cow and anxiously looking for her morning feed. No further treatment was prescribed more than careful dieting for a few days. The attendant informed me that the heifer got to her feet about 7 A. M., but I feel certain that was not the first time.

Now, the question is, was it or was it not, parturient fever?

WHAT WAS THIS TROUBLE?

WALTER M. PENDERGAST, Syracuse, N. Y.

HISTORY. On September 20th I was called to see a Holstein herd in which several animals were affected. The owner stated that the affected cow came in from the pasture at night, appearing dull and showing lack of appetite. From September 20th to 30th we had twenty cases in this herd. On September 27th another herd about six miles distant showed seven animals affected, with symptoms almost identical with those of the first herd. All of the animals affected were cows in milk with the exception of three young heifer calves about six months old.

SYMPTOMS. In the early stages the animals showed lack of appetite, high temperature 104° to 106°, pulse and respiration somewhat increased, milk secretion greatly decreased and what little could be drawn was thin and watery and contained clots of flocculent matter. The milk also showed minute blood clots which gave it a distinct pinkish cast in most of the cases. All four quarters of udder were affected, but did not show any swelling or tenderness. There was slight constipation with the feces a very dark color, almost black. In two or three days there was generally marked improvement with fall of temperature and return of appetite. After one or two weeks the animals seemed to return to a normal condition except some loss in condition.

TREATMENT. The first cases were given 1½ pounds of epsom salts, but some of the latter cases which did not get the salt seemed to do about as well. A fever mixture was given every three hours until temperature returned to near normal. Potassium nitrate ½ ounce and sodium bicarbonate 1 ounce were given twice a day for four days followed by sulphate of iron in 4 dram doses twice a day.

All of these cases appeared in cattle that were kept out at pasture; those stabled in the barn were not affected. On these two farms the pastures are on low, flat, clay soil, some of which had been overflowed a short time before the attack. It appeared to me that this trouble might be due to a fungous growth on the vegetation due to the excessive amount of rain which we have had the past summer.

ABSTRACTS FROM RECENT LITERATURE

CEREBRAL SOFTENING. Veterinary Major Floriot. *Rec. de Med. Vet.* An eight year old gelding was found one morning lying in his stall and unable to get up. He had a few skin scratches on the orbital arches and a slight discharge. He moved his legs and the skin all over his body remained insensible to the pricks of a pin. His temperature was 37.1°C. Respirations a little accelerated. He had never shown any brain symptoms. Frictions of oil of turpentine were prescribed and 20 c.c. of ether injected subcutaneously. He then got up for a few minutes and then dropped. Coffee and alcohol were given. He got up again and remained standing for three-quarters of an hour. He laid down after this and died a few hours later.

POST-MORTEM. Body in good condition. Blood normal. Thoracic and abdominal organs normal also. In the cranium, there was no fracture, the meninges appeared normal. In the brain the right lobe was the center of softening and in the ventricle two fibrinous clots were found. Cephalo-rachidian fluid was very abundant. The spinal cord was normal.

A. L.

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MODIFICATIONS OF BACTERIA IN THE ANIMAL BODY, XI. STUDIES ON NON-CAPSULATED ANTHRAX. (VERANDERUNGEN VON BAKTERIN IM TIERKORPER, XI. UNTERSCHUNGEN UBER KAPSELLOSEN MILZBRAND). Dr. Oscar Bail; University of Prague. *Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten: Originale, Vol. 76, pp. 38–46, 1915.*—In a previous communication the author described (this Centralblatt Vol. 75, Orig., No. 2) a strain of anthrax bacillus obtained by heating a normal culture to 48° to 49°. This was now used to study the relation between capsule formation, spore formation and pathogenicity. It was found that there was no apparent relation between capsule and spore forming power, but between capsule forming power and virulence there was a close connection. The new strain was entirely similar in its characters to the regular form of anthrax bacillus, being different of course, in having no capsule and a much diminished virulence. An examination of over 100 cultures in fluid serum and of 3000 colonies taken off agar plates showed only capsule free forms. Neither

the capsule forming power nor lost virulence were restored on passing this bacillus through several susceptible animals. Edema is produced when the culture is injected subcutaneously, in mice and rabbits.

BERG.

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HOG CHOLERA SERUM. "Lab. Bul. No. 2, 10-23-15. Experiment No. 82 Hog Cholera Serum, begun 6-16-13 by E. W. Mumma and John Reichel." *Mulford Veterinary Bulletin No. 2, Vol. 7, January, 1916.*—"Problem: To determine the value of carbolic acid and trikresol in the preservation of hog cholera serum, defibrinated blood.

Carbolic acid is generally used as the preservative of hog cholera serum, even though comparatively little is known of its value as a germicide in such a product as hog cholera serum in the form of defibrinated blood as originally prepared by Dorset, McBryde and Niles. That carbolic acid itself has little or no effect on the potency of the product is conclusively established.

Whether trikresol is equally harmless and as effective as a preservative remains to be shown.

Hog cholera serum as generally prepared is not sterile. The blood as drawn from the serum producing animal is invariably contaminated and subsequent handling in defibrination allows for additional contamination, up to the time the preservative is added, varying in degree with the care exercised in its preparation. Even though it is possible to obtain sterile blood from a serum producing hog this can only be said of experimental trials and in producing hog cholera serum, defibrinated blood, in a practical way the question of sterility must be entirely sacrificed.

Carbolic acid will not sterilize this contaminated product and the question naturally arises does it hold the organism in check whether present in large or small numbers,"

Results of the experiment are briefly summarized as follows:

"1. Carbolic acid must be used in less than 0.75% to avoid changes in the physical appearance of hog cholera serum, defibrinated blood.

2. Trikresol must be used in less than 0.6% for the same reason.

3. Carbolic acid added in amounts up to 0.75% to lightly or heavily contaminated defibrinated blood first caused a decrease in

the number of bacteria followed by an increase exceeding the first bacterial count.

4. Trikresol with a carbolic acid coefficient of 2.87% added in amounts up to 0.6% was also followed by an increase then a decrease practically equal to that which occurred in the carbolized samples.

5. All of the controls, without any preservation, showed an increase in the bacterial count from the time the samples were first set aside (8–12°C) along with those to which a preservative had been added. This increase was followed by a noticeable decrease, and the last account was on an average lower in the control samples than those treated. That putrefactive changes took place was appreciated by the odor and liquefied appearance of the product.

6. No odor or putrefactive changes were observed in the carbolized and trikresolized samples. Both preservatives served well in this respect, but this alone must not be accepted as proof of the value of either preservative for defibrinated blood.

7. From the limited number of examinations made in these experiments, as to the types of bacteria which survive and then flourish in the carbolized and trikresolized samples, it can be said that the types were not limited to the spore forming bacteria alone, as organisms of the colon type, staphylococci and streptococci were found as long as the samples were kept.

8. Contaminated hog cholera serum, defibrinated blood, cannot be sterilized by the addition of carbolic acid and trikresol in practical amounts, and the numbers of bacteria are not kept in check by the preservative.

9. No evidence is brought forth here to show that carbolic acid or trikresol would not serve well as preservatives when added to a sterile product.

10. Hog cholera serum must be prepared in a sterile manner or sterilized by one means or another to enable carbolic acid or trikresol to serve as a satisfactory preservative.

11. The physical nature of hog cholera serum, defibrinated blood, probably has much to do with the limitations of carbolic acid and trikresol as preservatives, and it is highly probable that both would prove more effective if the insoluble, inert material, fibrin, cellular debris, etc., were eliminated from hog cholera serum. These inert materials undoubtedly exert a large influence in the compli-

cations following the use of the product, and for this reason alone should not be allowed to remain in hog cholera serum on the market."

REICHEL.

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LACERATION OF THE STOMACH BY DUODENAL OBSTRUCTION DUE TO ASCARIDS. Veterinary Major Floriot. *Rec. de Med. Vet.* A gelding eight years of age had slight colics. Rectal injections were given and frictions of turpentine were prescribed. An injection of pilocarpine was made. No relief following after a few hours, 40 grams of tincture of opium were administered. The colic subsided but returned more violently the next day. Then the face had an anxious look; the body was covered with perspiration; the legs were cold; there were acid eructations and suddenly he dropped down and died.

At the postmortem the principle lesions were in the abdominal cavity. In opening it, there was an escape of red, wine-colored fluid mixed with food. The stomach was ruptured along the great curvature; the edges were ecchymotic and the mucous membrane was covered with bots in large quantity. There was one ascarid engaged in the pylorus. About sixty centimeters from the pylorus the duodenum was literally packed with ascarids on a length of 20 centimeters, making a most complete obstruction. About 100 worms were counted in the small intestine. The other organs were normal.

A. L.

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MEAT DRIED IN VACUUM COMPARED WITH CHILLED AND FROZEN MEAT. (LA VIANDE DESHYDRATEE PAR LA VIDE, COMPAREE A LA VIANDE REFROIDIE ET CONGELEE) by Raynal; Paris. *Recueil dé Medicine Vétérinaire, Vol. 91, pp. 603–608, 1915.*—Certain French papers have advocated the use of meat dried in vacuum. The author claims that such meat cannot replace chilled or frozen meat. Theoretically, the outer dry layers should protect the inner meat fibers. Practically this is not true. Such dried meat requires great care in handling, as the outer dry layer is very fragile, easily breaking and exposing the inner part of the meat. The author recommends the following methods of preserving meat:

a—for short periods, from 8 to 20 days, but if possible, not to

exceed 10 days—chilling at minus 2 to plus 2 degrees C. (28–36 degrees F.)

b—for long periods, from 5 to 16 months—freezing at minus 5 to minus 28 degrees C (plus 21 to minus 18 degrees F).

The author points out many of the disadvantages of the dried meat and the advantages of the other two varieties.

BERG.

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EQUINE TUBERCULOSIS by Captain J. D. Broome, A.V.C., *Veterinary Record.*—This is the record of a post-mortem on a fourteen year old gelding which was destroyed on account of his condition: the cadaver was much emaciated. Stomach and intestines full of ingesta. Diaphragm studded with tubercles, varying in size from that of a barley grain to a pigeon's egg. The tubercles were over the muscular and tendinous portions of both surfaces of the diaphragm. The spleen had several large tubercles with numerous smaller ones over the peritoneal covering. Some were on the liver, close to the lymph glands. They were on the covering of the organ, none in the structure. The kidneys were normal. The renal lymphatic glands were enlarged and tuberculous. The glands near the pancreas were also diseased. There was one tubercle in the wall of the stomach close to its junction with the duodeum. The mesenteric, colic, internal and external iliac lymphatic glands were normal. The lungs were crammed with miliary tubercles but the pleura was free from them, except where it covered the diaphragm. The mediastinal glands, the bronchial and supra-sternal glands were also tuberculous. The submaxillary, the pharyngeal and post pharyngeal were also presenting different stages of the disease.

A. L.

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THE ABDERHALDEN REACTION, D. D. Van Slyke, M. Vinograd-Villchur and J. R. Losee. *New York Jour. Biological Chemistry, Vol. 23, pp. 377–406, 1915.*—The present work was undertaken in the hope of providing for the measurement of serum protease a quantitative method sufficiently simple, accurate, free from subjective influence, and specific for proteolysis to afford definite conclusions concerning at least the facts of the Abderhalden reaction,

These experimenters did not use the Abderhalden ninhydrin test; instead a very delicate and accurate quantitative chemical method of measuring the extent of the ferment action was used. The preparation of placenta substrate, etc. was carried out as directed by Abderhalden and every precaution taken to insure freedom from error. They state "The difference even in the averages, is not great, however, and the individual variations of both pregnant and non-pregnant sera make the results from both overlap so completely, as to render the reaction, even with quantitative technic, absolutely indecisive for either positive or negative diagnosis of pregnancy. Further evidence of non-specificity is seen in the fact that carcinoma tissue was digested to about the same extent as was placenta."

For an interesting discussion of the nature of the Abderhalden reaction in immunological, rather than chemical terms, see Bronfen brenner; Biochemical Bulletin, Vol. 4, pp. 86–89, 1915.

It is highly probable that above findings will weigh heavily against the acceptance of the Aberhalden test.

Similarly negative results with this reaction were obtained by Berg; Report of Chief of Bureau of Animal Industdy, 1914, p. 32.

BERG.

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LOCALIZED TETANUS by Doctor Pozzi. *Academie de Medicine.*—The author related one observation of localized tetanus, with a paraplegic form of the lower limbs, appearing early, five days after the wound was received, viz: a severe injury of the left foot which had necessitated sub-malleolar amputation.

First, tonic spasms which later became very painful and yet remained localized to the left leg and thigh and were now and then manifested in the right also, leaving the patient no rest nor sleep. At first the temperature was elevated, but gradually dropped down. The cicatrization went on normally. The condition of the subject was very good. The treatment consisted in large doses of chloral and pantopon with massive doses of antitetanic serum. Great improvement has followed but slowly and the leg still remains convulsively contracted at the thigh. This stiffness will probably remain for a long time. Cases of limited or localized tetanus are very rare and those which affect only one leg are exceptionally observed.

A. L.

THE SEAT OF THE EMETIC ACTION OF VARIOUS DRUGS, Cary Eggleston and R. A. Hatcher, New York. *Jour. Pharmacology and Exper Therapeutics, Vol 7, pp. 225–253, 1915.*—Throughout this entire series of experiments (on dogs) it is to be observed that the smallest emetic oral dose was always larger than that required by intravenous administration, with but two exceptions, namely, the ipecac alkaloids, in which cases the doses for the two modes of administration were practically the same. In our previous studies on apomorphine and on the digitalis bodies the oral dose was also found to be materially larger than the intravenous dose.

Conclusions.—Practically all alkaloids and alkaloidal drugs in common use which produce nausea and vomiting, either as their chief or as their side actions, do so by direct action upon the vomiting center; i.e., morphine and preparations containing it, emetine, cephaelin, quinine, ergot, apomorphine, nicotine and lobeline, pilocarpine, aconitine, and veratrine.

Sodium salicylate, picrotoxin and the digitalis bodies also produce nausea and emesis through direct central action.

The evidence in favor of the central action does not in every instance exclude the possibility of the drugs also having an irritant action on the alimentary mucosa when given orally. It is probable that the ipecac alkaloids, veratrine and sodium salicylate may have this reflex action in man, at least in susceptible individuals.

Some of the advantages claimed for certain proprietary preparations of opium, such as narcophin and pantopium are refuted by the results of the present experiments, this is also probabley true to a certain extent of some of the proprietary preparations of salicylic acid.

—o— BERG.

THE LIFE HISTORY OF NEMATODIRUS FILICOLLIS, RUD., A NEMATODE PARASITE OF THE SHEEP'S INTESTINE. Charles N. Boulenger. *Parasitology, Cambridge (Eng.), Sept., 1915, v. 8 (2), pp. 133–155, pls. 8–9, text figs. 1–5.*—In his historical sketch Boulenger notes that the common form from the United States, regarded by Curtice and by Ransom as *N. filicollis*, is *N. spathiger*. It also appears that the worms from Africa regarded by Maupas and Seurat as *N. filicollis* are *N. spathiger*. Boulenger is thus in accord with Railliet and Henry who were the first to call attention to the confusion between the species *Nematodirus filicollis* and *Nematodirus spathiger*.

Boulenger gives a detailed account of the developmental stages of *N. filicollis* from the egg to the ensheathed larva. Embryos develop in the eggs in water or moist feces if sufficiently aerated, the presence or absence of light being of little or no importance, while temperature conditions are, as usual, of great importance. The most favorable range of temperature is between 19°C. and 27°C. Eggs are in the 7 to 8 celled stage when oviposited and appear in the feces in this stage. The morula stage is attained in 3 to 4 days, quickly followed by the "tadpole" stage. At the end of 2 weeks the embryo is five times as long as the containing shell. During the next two weeks the young worm undergoes two moults, appearing at the end of this time as a transparent, highly refractive larva, enclosed in a sheath which consists of the unshed skin derived from the second moult and still surrounded by the skin shed at the first moult. It was found that these larvae would hatch from the shell more readily when submitted to alternate moistening and drying. It was found, however, that exposure to temperatures between 24 and 32°C. was much more efficacious in causing the eggs to hatch. Having undergone two moults within the shell, the larvae are in the third stage when they leave the shell and are about one millimeter long. A forking of the tail is a common abnormality.

It was determined that the larvae have the same habit of ascending blades of grass that Ransom described for the larvae of the stomach worm, *Haemonchus contortus*. (It is probable that this habit of crawling up grass blades and other vegetation, a device for attaining the digestive tract of the herbivore host, will be found to be quite general for nematodes having a simple life history and parasitic in such hosts.) Ensheathed larvae were kept alive in water for over 11 months. They will survive drying and when dry will endure temperatures of 60°C., but are killed by exposure to over 50°C. in water. When dried they are very resistant to cold and withstand repeated exposure to freezing temperatures.

Under the influence of high temperatures, the larvae leave their ensheathing skins and this fact indicates that normally the skins would be shed under the stimulus of the body temperature when these larvae were ingested by the host animal.

M. C. HALL.

RESPIRATORY ANAESTHESIA IN ANIMALS. L. A. Merrilat, Chicago. *Jour. Comparative Pathology and Therapeutics, Vol. 28, pp. 217–225, 1915.*

1. For slight anaesthesia suitable for short operations the respiratory delivery is safe even in the hands of untrained anaesthetists.

2. For the profound anaesthesia required for serious and long operations respiratory anaesthesia is safe only in the hands of experts.

3. The most discouraging part of respiratory anaesthesia for animals is the difficulty of regulating the dosage. We need an apparatus to measure automatically the vapour delivered and consumed by the patient. (See abstract of paper by Meltzer below).

4. For profound anaesthesia of considerable duration, the best way to keep within the limits of safety is by administering a preliminary anaesthetic of chloral, followed by chloroform, and then maintain the narcosis with a terminal anaesthetic of alcohol, chloroform and ether.

5. Despite profound anaesthesia, exhaustion of the brain follows serious operations. This may be prevented by blocking with cocaine the nerve trunks which lead from the seat of operation. (It was Crile who demonstrated that the brain is being continually bombarded with impressions from the seat of operation in spite of even very profound anaesthesia).

6. The endotrachael delivery of respiratory anaesthetics is worthy of a trial. It is a step in the direction of dose regulation suitable for animals. (see Meltzer, below).

7. Intravenous delivery of ether and chloroform is unsafe with the apparatus we now have for their administration.

BERG.

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THE METHOD OF INTRATRACHAEL INSUFFLATION, ITS SCIENTIFIC BASIS AND PRACTICAL APPLICATION. S. J. Meltzer, Rockefeller Institute, New York. *Berliner Klinische Wochenschrift, Vol. 47, pp. 566–571, 1910.*—In this method, a tube is passed through the mouth into the trachea until the end of the tube reaches to within an inch of the bifurcation. The other end of the tube is connected with an apparatus. This consists essentially of two bottles, one empty, the other containing ether, so connected with tubing that a stream of air can be sent through the empty bottle or through the ether, or

both, through the tracheal tube into the animal. By properly setting the stop cocks, the anesthetist can pass a carefully regulated stream of air and ether into an animal. This method has several advantages, among which may be mentioned: much less anaesthetic is needed because it is delivered directly into the lung. The amount can be controlled so easily that the animal can be promptly brought out of anesthesia or more deeply anesthetized. The excess of ether is swept out by the stream of air flowing, not into the lung, but out of it. This also prevents foreign particles from getting into the lung and obviates post operative pneumonia, so frequent in the ordinary anaesthesia. (See Merillat, above).

BERG.

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URTICARIA by E. Wallis Hoare, F.R.C.V.S. *Veterinary Record.* Well bred gelding, eighteen months old in good condition, has always been healthy. After being turned out on grass for two hours, his face and nostrils were noticed as being much swollen. The swelling increased rapidly, the eyes were closed and the sheath began to swell. When seen by the author he presented the following symptoms: nasal region, cheeks, nostrils and lips greatly swollen, breathing stertorous, nasal mucosa could not be explored. The eyelids were edematous and both eyes completely closed. The sheath was swollen and there was some paraphymosis. The case on superficial examination looked like purpura. The entire body was covered with an eruption noticed through the thick coat as hard flattened papules. Temperature could not be taken.

Was it a case of urticaria or one of purpura?

Treatment: Fomentations of the swollen parts. Steam inhalations. Potash clorate twice a day. Electuary of terebene three times a day.

The next day almost all the symptoms were gone and the animal was looking for food. It was after all a case of urticaria which resembled purpura and could puzzle a beginner.

A. L.

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THE ETIOLOGY OF "SYMPTOMATIC ANTHRAX" IN SWINE. "SPECIFIC GAS PHLEGMON OF HOGS" K. F. Meyer, University of California. *Jour. Infectious Diseases, Vol. 17, pp. 458–496, 1915.*—The

report describes the recognition in the United States of a disease of hogs, well described in European publications, which anatomically resembles symptomatic anthrax in cattle. The cases studied belonged to a small epidemic and are not sporadic cases as reported from Hungary. The lesions and the deaths of the animals were due to the Ghon-Sachs bacillus, which was properly identified by all well known means. Etiologically, the American cases are therefore identical with the European ones.

In animal pathology this bacillus unquestionably plays an important role. The various descriptions given by Miessner, Markoff, Levens and others for anaerobic organisms responsible for parturient symptomatic anthrax, bradsot of sheep, and blackleg of horses, correspond in almost every point with the facts brought out by this study. Most of the workers, however, did not extend their studies sufficiently far to enable them to identify the organisms with the Ghon-Sachs bacillus.

The Ghon-Sachs bacillus has many characteristics in common with the blackleg bacillus (bacillus gangraenae emphysematosae or as it is also called, bacterium Chauveaui) and extensive testing is required for their differentiation. But this can be done with certainty by using the various serological tests described.

The name "specific gas phlegmon of hogs" is proposed by the writer for the disease, which, though resembling blackleg or symptomatic anthrax in cattle is distinct from it.

BERG.

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TREATMENT OF PERVIOUS URACHUS IN FOALS by J. H. Parker. *Veterinary Record.*—The writer has had over 20 years experience in a district where all kinds of foals are bred and has seen a great deal of pervious urachus and joint evil. For the former, he cast the foal, turned it on its back, injected two drams of tincture of iodine into the urachus. With needle and silk he passed through the skin surrounding the urachus, as a ligature a knot and applied plenty of boric powder and let the whole slough off. He then injected the foal with *Staphyloccus albus, citrus, aureus,* and every thing went all right. This treatment answers well also for joint evil.

A. L.

HEMORRHAGIC LEPTOMENINGITIS AND LYMPHADENITIS IN ANTHRAX. Dr. Fritz Herzog. *Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie; Vol. 60, pp. 513–543, 1915.* University of Greifswald, Germany.—A very detailed description of the post-mortem findings in three cases of anthrax in man. In two of these there were pustules on the face, on the other, on the hand, which were regarded as the seats of infection. All three ran a similar course, favorable in the beginning of the disease, followed by sudden onset of grave general symptoms, and death soon resulting. On autopsy, all three showed a severe "Leptomeningitis anthracica" while the other organs showed only slight pathological changes. The blood vessels in the arachnoid and pia membranes were affected; a layer of blood covered the cerebral hemispheres and filled the fissures.

BERG.

In an opinion rendered by attorney general Atwill of Boston, Mass. and accepted by the governor and council, Dr. Lester H. Howard will have two years more to serve as commissioner of animal industry. Charges against Dr. Howard's administration had been brought before the governor's council due to losses occasioned by closing the cattle market during the quarantine of a suspected case of foot-and-mouth disease. The losses were proved, but the responsibility was shown to have been the owners'. The quarantine was shown to have been good judgment and the length of time not unreasonable.

The decision meets the approval of the Massachusetts veterinarians generally and indicates a determination to place such an important department as that of animal industry beyond the vagaries of changing political administrations.

SALARY INCREASE FOR VETERINARIANS (Department of Health) $1,320 per annum ($1,800 to $2,340 increase has been urged)—Applications issued at Room 1400, Municipal Building up to 4 p. m. January 31: Subjects and weights: Experience, 3; Technical, 7. Candidates must be licensed to practice in the State of New York. Knowledge of contagious diseases of animals necessary, ante-mortem and post-mortem inspections at slaughter houses are part of duties. Age limit 21 years. For further particulars see "City Record" or apply Municipal Commission, New York City.

PROCEEDINGS OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

REPORT OF THE COMMITTEE ON VETERINARY EDUCATION IN VETERINARY COLLEGES.

(Continued from page 496)

It is undoubtedly true that much of the instruction now given at agricultural colleges is unwise and unprofitable to agriculturists yet the instructor in veterinary science is placed in a difficult position. He is tempted on the one hand to give the student an attractive and interesting course, fill his department with students, and ends in graduating a bunch of "quacks". The work must somehow be made interesting and yet not defeat itself by creating an impression in the minds of the students that they are trained graduates of veterinary medicine. That this condition prevails is shown by a statement of one college in its catalogue, as follows:

> 'It is not the object to turn out professional veterinarians, as this is impossible with the time, equipment, and teaching force alloted this department. Students desiring to graduate in veterinary medicine will find it advantageous to complete the agricultural course, then enter the veterinary medical department of some well-equipped school. This course is intended only to aid in the study of agriculture. Its aim is to instruct students in the care of live stock in health and disease. Particular attention is given to the prevention of disease. The course is as practical as it can be made. The student first studies the structure of the animal body and its normal functions. The abnormal is next taken up, including the non-infectious and contagious diseases, together with lameness and soundness."

However, as before stated your committee has considered this matter very carefully and begs to submit recommendations as follows:

Suggestions Regarding a Course in Veterinary Science for Agricultural Students.

Recommendation No. 1. That at least one veterinarian, who shall be a graduate of an accredited veterinary college, shall be employed and devote his whole time to teaching veterinary science subjects and experiment station work.

Recommendation No. 2. That a pre-requisite to the study of veterinary science for agricultural students shall be a knowledge

of elementary physics, chemistry, general zoology, general botany, microscopy, or general bacteriology.

RECOMMENDATION No. 3. That a further pre-requisite to the study of veterinary science for agricultural students shall be instruction in animal husbandry and dairy husbandry, which shall include animal breeding, feeding of domestic animals, live stock judging, and handling of dairy products. Advanced live stock judging, conformation and soundness should not be given until the students have had a course in veterinary anatomy and physiology to familiarize them with the structure of the animals with which they are to deal as a whole.

RECOMMENDATION No. 4. That instruction be given in veterinary anatomy to include the dentition of farm animals, a study of the skeletons of the horse and the cow with reference to the skeletons of other domestic animals, and sufficient dissection of either large or small animals to familiarize the student with the gross structure of the important muscles, blood-vessels and nerves and the organs of digestion and reproduction.

RECOMMENDATION No. 5. That instruction be given in general physiology and veterinary hygiene. The latter at least to be taught by a veterinarian. The teaching in physiology to make constant reference to the comparative physiology of domestic animals and to be supplemented by experiments in the physiological laboratory.

RECOMMENDATION No. 6. That instruction be given in the reproduction of farm animals, the hygiene of pregnant animals, normal parturition, care of the new born, weaning young animals, etc.

RECOMMENDATION No. 7. That instruction be given in the common or sporadic diseases of live stock caused by injurious forage plants, improper care and handling, and the common remedies indicated with special emphasis on the cause and prevention of such diseases. This instruction to include lectures on horse-shoeing and lameness.

RECOMMENDATION No. 8. That instruction be given in practical laboratory work during the last year, either at a veterinary hospital or on the live stock of the college. This instruction should not develop into a regular veterinary clinic such as belongs to the strictly technical field of a veterinary college, but should include demonstrations in harnessing, hitching, driving and handling of horses, as well as the breaking in of colts, unless such demonstrations have been given in animal husbandry work, animal restraint, bandaging, methods of administering medicines, reading of temperatures, pulse, respirations, etc.

RECOMMENDATION No. 9. That instruction be given in the final (senior) year in the animal plagues or infectious diseases of animals; their causes (pathogenic bacteria); their recognition and control. This instruction to include sanitation to prevent the spread of infection, and inspection to prevent the consumption of the meat of diseased animals.

RECOMMENDATION No. 10. That the fundamental idea of the instruction in veterinary science and allied subjects in agricultural colleges should be for the purpose of teaching the future farmers and live stock growers the best methods for raising and maintaining healthy animals and not attempt to qualify agricultural students to become veterinary practitioners. This result depends largely on the teacher, and it is recommended that the veterinarians employed should teach with the object in view of educating well equipped stockmen and not of developing veterinarians qualified to practice.

A. M. FARRINGTON,
PAUL FISHER,
JAS. B. PAIGE,
Committee.

PRESIDENT MARSHALL: What do you wish to do with the report of the special committee on the agricultural college investigation?

DR. KEANE: I move the acceptance of the report. Seconded.

PRESIDENT MARSHALL: It has been moved and seconded that the report of the special committee on agricultural college investigation be received. Any remarks. If not, it is so ordered.

The secretary having now produced the report of the committee on veterinary anatomical nomenclature, we will listen to the report, read by Dr. Newsom.

The signed report of the special committee on anatomical nomenclature is as follows:

REPORT OF THE SPECIAL COMMITTEE ON REVISION OF VETERINARY ANATOMICAL NOMENCLATURE.

To the American Veterinary Medical Association,

GENTLEMEN:

Your committee on revision of veterinary anatomical nomenclature begs to submit the following report:

The work has proceeded on the principles which were laid down in the preliminary report adopted by the association in 1912, and which were followed in the report of the following year. The report now submitted comprises the names for the circulatory system, the nervous system, the organs of the senses, and the common integument.

The great majority of the terms were agreed to unanimously by the committee; in quite exceptional cases a decision was reached by a majority vote. The committee feels more strongly than ever that in debatable cases agreement on the selection of a term is the prime desideratum, and that personal preferences, even when well-grounded and strongly held, should not be permitted to block progress toward substantial uniformity. It is a pleasure to the chair-

man to say that this attitude in the members of the committee has greatly facilitated the work.

The committee has been extremely conservative concerning the introduction of new names. On the other hand it has rejected many terms which appeared to be superfluous, keeping constantly in mind the urgent need of greatly diminishing the number of names.

It will be noted that a number of terms which refer to special features in the anatomy of birds are included in a separate list at the end of the report, instead of appearing in their systematic order. The explanation of this circumstance is that the committee thought it advisable last year to defer these on the ground that they were relatively of secondary importance and that the consideration of them might involve so many problems as to prevent the presentation at this time of a report otherwise fairly complete. It may be added that the list of special avian terms embraces only those names which appeared to the committee to be necessary for veterinary purposes.

The committee recommends the following terms which were inadvertently omitted from previous lists:

P. 197 Ala ossis sacri
P. 199 Planum temporale (ossis parietalis)
" Facies orbitalis (partis orbitalis)
" Facies nasalis (ossis frontalis)
" Apex (partis petrosae ossis temporalis)
P. 201 Facies nasalis (ossis zygomaticis)
P. 202 Sutura squamofrontalis
" Sutura nasolacrimalis
P. 210 M. cervicalis ascendens
P. 216 Pila coronaria dorsalis (ruminis)
" Pila coronaria ventralis (ruminis)
P. 221 Lig, teres vesicae

The names submitted herewith were filed with the secretary last November in order to comply with the instruction of the association that the report be printed and sent out to those interested, thirty days before the next meeting.

(Signed) SEPTIMUS SISSION, *Chairman.*
I. E. NEWSOM
S. L. STEWART.

(Page numbers refer to Proceedings of A. V. M. A.)

PRESIDENT MARSHALL: What do you wish to do with the report of the committee on veterinary anatomical nomenclature?

DR. KINSLEY: I move that the report be accepted and referred to the committee on publication.

PRESIDENT MARSHALL: It has been moved and seconded that the report of the committee be accepted and referred to the committee on publication. Any remarks? If not, and there are no objections, it is so ordered.

The next on the program is the report of the committee on glanders. The secretary tells me he has not received such a report. Some members of that committee are present. Perhaps they may have some remarks to make on that report. Is Dr. Eichhorn, or Dr. Keane, or Dr. McGilvray, all members of that committee present, and if so, have either of you any remarks to make? If not, it may be possible to call for that tomorrow.

DR. MAYO: The meeting of the Alumni of the New York College of Veterinary Surgeons, the American Veterinary College, the Columbia Veterinary College, and the New York Veterinary College, will be held in Room 109, Mezzanine floor, tonight at seven thirty, just before the reception.

PRESIDENT MARSHALL: Any other business to come before the session this morning? If not, we will adjourn until tomorrow morning. We will hope to have the report of the international tuberculosis commission and the committee on necrology before the session in the morning.

A motion to adjourn is now in order.

Which motion being made and seconded, was carried and the meeting was adjourned until the following morning at nine thirty o'clock.

Oakland, California, September 1, 1915.—The fourth business session of the fifty-second annual meeting of the American Veterinary Medical Association was called to order by the president, Clarence J. Marshall, at 9:30 o'clock, A. M.

PRESIDENT MARSHALL: The first thing on the program this morning is the report of the executive committee.

DR. MAYO: The executive committee begs to report the following:

"In accordance with the recommendations from the president and secretary, it is the opinion of the executive committee that the present methods of publishing the proceedings and papers of the association are not conducive of the best interests of the association and the veterinary profession as a whole, and,

Whereas, It is believed that the nature, age and purposes of the association warrant the establishment of an official organ for the association,

Therefore, Be It Resolved, That the executive committee, at its annual meeting now in session convened, be authorized by this association to take such measures as may be necessary to establish an official organ of the association to be known as *The Journal of the American Veterinary Medical Association,* and be it further

Resolved, That the executive committee be authorized to appropriate such moneys from the general funds of the association or by assessment as provided

by the by-laws as may be necessary to carry into effect the intent and purposes of this resolution, and be it further

Resolved, That the executive committee as constituted at this present convention, be continued as a committee on journal to take the place of the publication committee until otherwise provided for, and further be invested with the necessary powers to carry into effect the intent and purposes of this resolution.''

PRESIDENT MARSHALL: Gentlemen, what will you do with the recommendation from the executive committee?

DR. HOSKINS: Mr, Chairman, in order to have the matter before the association, I move that the recommendation of the committee be accepted.

PRESIDENT MARSHALL: Gentlemen, you have heard the motion. It has been moved and seconded that the recommendation be accepted. Any remarks?

DR. STEWART: Mr. President, there is just one paragraph I do not like. I think it was the last one in reference to the continuance of the same executive committee. What was that?

DR. MAYO: ''And be it further resolved, that the executive committee as constituted at this present convention, be continued as a committee on journal to take the place of the publication committee until otherwise provided for, and further be invested with the necessary powers to carry into effect the intent and purposes of this resolution.''

DR. STEWART: I thought I heard that right. And does that include all the ex-officio members of that executive committee, or only the appointed committee?

PRESIDENT MARSHALL: I understood it included all the elected and appointed officers of the executive committee. Is that your understanding of it?

DR. MAYO: I suppose so.

DR. KINSLEY: Mr. Chairman, I would like to know if the committee has estimated the cost of publishing a journal by setting forth the proceedings in the same manner as heretofore arranged.

DR. MAYO: I will state that there has been estimates made upon this. It is the opinion of those well posted to estimate, Dr. Campbell and others, that the publication of the Journal, properly carried out, will prove really a source of profit to the association. At the present time the publication will probably cost, we will say, approximately, four thousand dollars a year. Another estimate from the editor and publisher of a Medical Journal with many years experience, thought possibly the cost to the association would be two thousand dollars the first year to publish, or rather to establish the publication of a Veterinary Journal and after that, it would be self sustaining.

DR. KINSLEY: Mr. Chairman, I would like to ask a question. The executive committee, why do they consider it essential to continue this present executive committee as the publication committee? What is the object of such a large committee?

DR. MAYO: I would say, in a general way, that this is a new venture and it will be necessary to give the executive committee a comparatively free hand the first year in establishing an official Journal.

DR. HOSKINS: I think it would be a very unwise thing to place it in the hands of the new body which have not gone over all of the various aspects of the proposition. The proposition of having the matter remain in the hands of the men who have gone over the proposition thoroughly, commended itself very highly to me. These men, the present members of the committee, have gone over all the various aspects of the case and are prepared to enter upon the work of carrying out the plan of the association, which is the hardest part of the work, and I am sure you will agree that any new work requires a great deal of study and thought and it was my idea that these men, who have thought out the situation as far as they can, should be ready to carry on the work of establishing a Journal, at least for the first year. That proposition commended itself very highly to me, that is, that it should remain in the hands of this committee, in view of the fact that they are better prepared to carry out the views of the association if it is decided to establish the Journal as recommended by the committee. These men have gone over the situation very thoronghly, have studied the various aspects of the case and therefore, would be more likely to carry out the enterprise to a successful conclusion. Then with newly elected officers, the body of men would not be acquainted with the proposition at all.

DR. CAMPBELL: To my mind, there is no question about the advisability of the action taken by the executive committee, that is, to start a Journal and after serious thought, I think they have gone about it the best way, under the best plans, to achieve greater success. It seems to me this report has come at an unfortunate time for in a few minutes we are to consider a report on reorganization and whether favorably or otherwise, that does not make much difference because we are going to decide whether we want it or whether it is going to be adopted or rejected and it seems the reorganization would have a great bearing upon the matter of publication. The change suggested by the plan of reorganization I believe would very much favor the successful adoption of this organization. I am not so sure that under our present system, a system designed many years ago for the association, confined as it was to a small locality and with no thought of any undertaking of this kind, could be successfully carried on. That is one point. I would rather see the consideration of this resolution postponed for say, thirty minutes, so we could consider the other matter first. It seems to me unfortunate, that the executive committee did not think of that and give us an opportunity to know what we were doing before we did it. There is a further objection. The present executive committee has served its time and is about to retire, another day and their time is up. If our new president knew that something of this kind was to be taken up by the executive committee, it might influence him in their appointment. It will be essential that the committeemen, at least the managing part of that committee live somewhat closely together so that they can get together without great expense. That matter might be taken into consideration in the appointment of the new committee. In other words, this committee which was appointed two years ago for an entirely different purpose and I am just wondering if a new committee with this idea in mind might make a difference with the committee on publication. I say this, of course, without any reflection on the members of the committee. I think the disadvantages of their serving is more a matter

of location than otherwise, that is, their being widely separated. Of course, every committee should be representative of the whole association. I should like to move that this report be laid aside until some action has been taken on the report of the plan of reorganization. Seconded by Dr. Kinsley.

PRESIDENT MARSHALL: Gentlemen, you have heard the motion by Dr. Campbell, which has been seconded by Dr. Kinsley. What is your pleasure, any remarks? If not, are you ready for the question? Those in favor of delaying action upon this recommendation of the executive committee, until the reports have been submitted in reference to the reorganization plan, signify by saying, "aye." Those opposed, the same. It is so ordered.

We will now hear the report of the executive committee in regard to the plan of reorganization.

DR. MAYO: It is recommended by the executive committee that the revisions of the constitution and by-laws be re-committed. I might say in explanation, that the executive committee are fully convinced of the need of a revision of the constitution and by-laws, but are also convinced that a much more important measure for the government of the association is the publication of an official Journal, and the committee feels that the first year would indicate to the committee much better than they understand now, the necessary changes that would have to be made to conform to the conditions as they arise in the publication of a Journal.

It will also give through the Journal an opportunity for the members throughout the country to discuss this question and become thoroughly informed as to the needs of a new constitution and by-laws, as possible. We feel that it would stimulate the interest by having this revision discussed through the Journal throughout the year and the different plans outlined so that it would come directly to every member and for that reason, it would be advisable to re-commit this question of the revision of the constitution and by-laws.

DR. HOSKINS: Mr. President, I move that we approve that recommendation and in so moving, I want to say that I believe we have done the right thing and I have thought that in this proposed revision, which we all hope may last and be better than the original constitution and by-laws, that we ought to have the largest number of members present, which it is possible to have so that when it is considered and adopted, it has been done with the approval and consideration of the largest possible proportion of our members.

We have here in California, less than one-tenth of the membership of this association at this convention and it does appear to me that in taking up the revision of the constitution and by-laws and the making of rules, which would be permanent for at least a number of years, that one-tenth of the membership is not sufficient to adopt such an important measure.

I feel that the very fact that the distance which separates us from a large portion of the members of the association ought not to deprive them of the opportunity of joining in the consideration of this proposition. I endorse the statement of the secretary that if we are going into the publication of the proceedings, that the intervening year, before the final action shall be taken of the revision of the constitution and by-laws, will be largely spent in giving every

one an opportunity to determine how best to make this revision, how best to direct the affairs of the association along the lines to secure larger and better interest for the association.

DR. MAYO: Mr. President, I wish to make it plain to every one that in discussing this question, we wish to express our highest appreciation to the committee that has had this matter in charge, for the large amount of efficient work that they have done. In re-committing this, they are to understand there are no objections to the committee at all.

DR. STEWART: I regret that the recommendation of the executive committee that this be re-committed does not carry with it some proposal for submitting the proposition as now presented or which might be re-committed to the committee, to work over and be presented to the membership at large. In the remarks of the Secretary and of Dr. Hoskins, it is pre-supposed that we shall adopt the resolution which has since been postponed and in the failure of its adoption, there is no provision in it for bringing before our entire membership this whole subject that they may digest it thoroughly and be prepared to discuss it at another meeting. I hope that the first resolution will carry. In the event that it fail, there should be in this resolution, provision made for its presentation to the entire membership.

DR. MAYO: Mr. President, in order to make amendments to the by-laws and the revision to the constitution, it must be left open one year previous. I mean to say a notice must be given one year previous. Now this leaves everything wide open, so that at the next meeting we can revise the constitution and by-laws in any way we may see fit and all the different plans that have been presented will still be before the association for consideration.

DR. STEWART: Mr. President, at the time the supposed alteration of the constitution and by-laws was first brought before the association, notice was given the year before. At the time of the annual meeting a resolution was made that the proposed alteration should be printed and distributed to the members that all might have a chance to study these alterations. The recommendation of the executive committee thus presented, does not make any provision for such a distribution. That is the point I was raising. This I hope can be modified. It should be printed and distributed prior to our next meeting if not through the medium of a journal, if we should fail in passing that resolution, then through some other medium.

DR. MAYO: In reply I will say to the members present, that the report of the committee as constituted at the previous meeting has been presented and is ready for distribution here and also I have copies of the old constitution and by-laws here. I will say that this was received by the secretary for distribution, a day or two before I left for this meeting and I wan unable to send them out and distribute them to the members of the association so that they would receive it before leaving for this meeting. Consequently, I brought them here and they are ready for distribution.

DR. HUGHES: Will the secretary kindly explain to us just why this delay should occur? Who is responsible for the printing of these proceedings, or rather revision of the constitution and by-laws and who is responsible for not distributing them before now?

DR. MAYO: In reply to Dr. Hughes' question, I might state that I am unable to state definitely who was responsible. I suppose the committee. They published it in reply to repeated requests from me. I supposed it was going to be turned over to me for publication and I wrote the chairman of the committee, several times, telling him that it must be in my hands at a certain time, so I could get it out the first of August. I did not receive it or any particular information regarding it. I did receive them just before I left Chicago and I brought them with me. I did not think it was advisable to distribute them before the association until the question came up. It was not with any idea of keeping the information away from the members that I failed to distribute these before this time but I have been rather busy and I just simply didn't think of presenting the question and distributing them until it should come up in the meeting as I knew this question would come up, I brought them here and they are here now for distribution if you want them. They have been here two days.

DR. CAMPBELL: I want to ask several things. One thing to correct some of the statements of the secretary, which he has made, believing them to be right, and also to answer some of Dr. Hughes' questions. The report which the secretary has on his table, is not the report of the committee on revision. It was not published by the committee on revision. It is a report that was published by the chairman of the committee, gotten up by him without consulting the other members of the committee and before coming to the executive committee, it was practically re-written. I hope it will not be distributed here. The distribution will do no harm but I hope it will not be distributed to the members with the idea that this is what the executive committee has been conconsidering, what they have asked to have re-submitted, because it is not. The plan of reorganization is not the same.

DR. MAYO: Mr. President, the only information that I have is that this is a printed report of a special committee upon reorganization from the American Veterinary Medical Association, with the names of H. D. Gill, D. M. Campbell, T. E. Maloney, George H. Hart, and P. Fischer, on it.

DR. HART: I never knew that Dr. Gill was revising the econstitution and by-laws until I received a printed copy two or three minutes ago and we were not consulted in the matter. The copies which have been presented to the committee are entirely different documents and if the members of the association are going to consider a revision of the constitution and by-laws, I would recommend that the copy which is now in the hands of the executive committee be printed in place of the document which has already been printed and ready for distribution, signed by Dr. Gill and of which the committee knew nothing.

DR. CAMPBELL: I don't understand the secretary when he says that he has received the report of the committee and accepted it as such. I don't know whether he merely said he received a certain report without accepting it as official. I say that report purporting to be a report of the committee, never was presented to the committee and the committee took no action on it and I say that the report which is now in the hands of the executive committe and as I understand, which the committee recommends to have re-committed is not the printed report which the secretary has here. That is an entirely different document,

DR. MAYO: Mr. President, all the information I have from the committee at all in any way, is the printed report which I received and supposed it was the unanimous report of the committee, it having the names of the committe on it. I had no information to the contrary. Now two members of the committee come up and say it is not the report of the committee. Now you decide the question. I don't know about that.

DR. HOSKINS: I move that the report of the committee be accepted and that the matter be re-committed. Seconded by Dr. Kinsley.

PRESIDENT MARSHALL: It has been moved and seconded that the report of the committee be accepted and that the matter of reorganization be re-committed. All those in favor, signify by saying, "aye."

DR. CAMPBELL: Mr. President, This committee has worked on this for three years and it has worked hard since this meeting began. They have brought the report of their labors to the association and hearing at this time has been denied them. They have been denied the opportunity to present their report. I think if they were disposed to insist upon it that courtesy to the committee alone would require you to listen to it and that the members of the committee should have been consulted further in this matter, however, since talking this over, we have decided that this should have further consideration and to forego any rights we have to a hearing, therefore, I wish to second this and hope that it will pass but that you will allow this committee to retire and require nothing further of it.

PRESIDENT MARSHALL: The question is, will we accept the recommendation of the executive committee?

DR. STEWART: I would like to be set right on what I am going to vote on. Is this to be re-committed to the executive committee or re-committed to the committee on reorganization

DR. MAYO: On reorganization, I suppose.

PRESIDENT MARSHALL: As we understand it, the question is, it is to be re-committed to the reorganization committee.

DR. KINSLEY: Is this same committee to be continued?

PRESIDENT MARSHALL: It does not necessarily mean that.

DR. HUGHES: In view of this fact, do you think you can make any progress a year from now by the re-appointment of this committee, in view of the fact that such a fiasco has been made of this thing? Who is responsible for this condition? It seems to me there should be a motion made to table this thing and let us start all over again.

PRESIDENT MARSHALL: Any further remarks?

The question has been called for. All those in favor of accepting the recommendation of the executive committee that the proposition of the revision of the constitution and by-laws be re-committed, make it manifest by saying "aye", those opposed, "no." The "ayes" have it; it is so ordered.

(To be continued)

SOCIETY MEETINGS

The tenth annual meeting of the Mississippi State Veterinary Medical Association was held at Columbus, Miss., January 11–12. The following program was presented:

President's Address.....Dr. W. L. Gates
Address of Welcome.....Dr. W. J. Lipscomb
Response.....Dr. E. M. Ranck
Address.....by the Mayor of Columbus, W. C. Gudnter
"Efficient Animal Motors" as "Economic Factors in Crop Production.....Dr. J. C. Robert
Hog Cholera and its Prevention.....Dr. S. E. Osborne
Colitis in Horses and Mules in the Mississippi Delta.....Dr. V. H. Knutzen
Hook and Stomach Worms of Young Calves.....Dr. E. Barnette
Texas Fever and its Treatment.....Dr. D. S. Taylor
My Experience in the Treatment of Equine Colic. Dr. J. T. Alston
Veterinarian's Duties.....Dr. W. P. Ferguson
Infection and Immunity.....Mr. Earl A. Keinzey
Foot-and-Mouth Disease.....Dr. J. A. Barger
The Future of the Veterinary Profession in Mississippi..Dr. E. M. Ranck
Bovine Tuberculosis.....Dr. Hudson Chadwick
Little Things.....Dr. O. M. Norton
Common Wounds and Their Treatment.....Dr. J. A. Beavers

The clinic was held at Dr. Oliver's hospital. The following demonstrations and operations were performed:

1. Methods of Passing Stomach Tube and its Indications..Dr. J. T. Alston
2. Amputation of Penis of Horse—Vaginal Ovariotomy in the Mare.....Dr. James Lewis
3. Firing for Spavin and Ringbone.....Dr. J. D. Townsend
4. Digital and Plantar Neurectomy and Indications for Operation.....Dr. B. M. Leigh
5. Arytenectomy.....Dr. S. E. Osborne
6. Trephining Facial Sinuses.....Dr. J. F. Barnett
7. Castration of Cryptorchid Horses.....Dr. J. A. Barger

Drugs and instruments displays were made by the following firms: H. K. Mulford Co., Philadelphia; Haussmann & Dunn, Chicago; John T. Milliken & Co., St. Louis; American Veterinary Supply Co., Kansas City.

The association contributed twenty dollars to the Salmon Memorial Fund and adopted the Blue Cross Emblem. The officers elected for the following year are: President, Dr. James Lewis, Greenwood, Miss.; Vice-President, Dr. J. T. Alston, Tupelo, Miss.; Secretary-Treasurer, Dr. E. S. Norton, Greenville, Miss., re-elected. The next meeting will be held at Clarksdale, Miss., January 10 and 11, 1917.

E. S. NORTON, *Secretary.*

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THE EIGHTH ANNUAL VETERINARY CONFERENCE AT ITHACA, N. Y., JANUARY 11 AND 12.

A large number of veterinarians were in attendance from various parts of the state. After some introductory remarks by Dean Moore, interesting papers were presented on Lead Poisoning, by Dr. Williams; Hookworms in Dogs, by Dr. Muldoon; Diagnosis of Swamp Fever, by Dr. Udall and Surgical Treatment of Necrosis of the Lateral Cartilage, by Dr. Adams of Philadelphia, with discussions.

In the afternoon there was a symposium upon biological products: a general survey of the field was offered in a most instructive paper on the Therapeutic Value of Biological Products in Veterinary Practice by Dr. Eichhorn of Washington, D. C. This was followed by a discussion from the manufacturers point of view, by Drs. Mayo of Chicago, King of Detroit and Reichel of Philadelphia. Following this was a discussion from the practitioner's standpoint, participated in by a number of veterinarians. Some favorable and some unfavorable testimony was offered but there was an evident tendency of a get together spirit between the producers and the users and a desire to meet on common ground so far as the limitations of biological knowledge would permit.

In the evening after a few words of welcome from Professor Sheared, as proxy for President Schurman, a most practical and illuminating address was listened to on the Relation of the Veterinarian to the Animal Industry of the state, by Dean Cook of the St. Lawrence School of Agriculture. Dean Cook's logic and dry humor kept the audience interested from start to finish. After some remarks on the New Re-registration Law by Dr. Stone a smoker was held.

On the second day the morning program included papers on Infectious Abortion, by Dr. Williams; Time is Money, by Dr. F. H. Miller of New York City; Verminous Bronchitis in Dogs, by Dr. Milks; Control and Eradication of Infectious Mastitis in Dairy Herds, by Dr. Moak of the Medical Milk Commission of Brooklyn. During the noon hour there were meetings of the Alumni Associations and a light lunch was served.

In the afternoon there was a demonstration of technique in immunizing hogs with anti-hog-cholera serum, by Dr. Milks followed by clinics in the small animal, medical and surgical departments.

In the evening a banquet was held at the Clinton House at which Dean Moore presided at Toastmaster. The list of speakers included Professor Shearer, Dr. Adams, Dr. Miller, Dr. Wills, Dean Galloway, Dr. Fish and Dr. Mayo. A committee, consisting of Drs. Ackerman, Williams and Fish was appointed by the toastmaster to send a cablegram to Dr. Liautard. The following message was sent: "Dr. A. Liautard, Bois Jerome, France. Appreciate past, sympathy for loss, hope for future."

P. A. F.

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Meeting of the Ohio State Veterinary Medical Association January 13 and 14.

The State Veterinary Medical Association of Ohio held its thirty-third annual meeting on the campus of the Ohio State University, Columbus, on January 13th and 14th.

The unusually large attendance, the excellent program and the interest manifested by those in attendance are further evidence that conditions veterinary are not at a standstill in Ohio, but are improving rapidly each year. An attendance of almost four hundred was recorded. Fourteen of our most widely known cemmercial houses made excellent exhibits and many sales.

The feature speaker imported for this meeting was Dr. Louis A. Merillat of Chicago, who addressed the organization on "The Surgery of Fistulous Withers", demonstrating the same on a patient secured for the purpose. Assisted by Dr. J. H. Blattenberg, he also demonstrated "The Technique of Post Mortem in the Field". So well was Dr. Merillat received by the association that he, a native Buckeye, by the way, wae elected an honorary member.

The dinner session, attended by one hundred and fifty, was held in the Ohio Union, Ohio State University, and proved a joyous

occasion. Just as the toasts were over and all were expecting to be formally dismissed, The Kaiser (Dr. J. H. Blattenberg of Lima) "rode" into our midst on "The General" (artificial horse) and with his strong cast of Mutt, Jeff, Henry Ford, The Royal Horse Doctor and The Royal Chamber Maid, "put on" an act entitled—"The Horse in War and After". It was a "scream".

The election of officers for 1916 resulted: President, Dr. Reuben Hilty, Toledo; Vice-President, Dr. Harry T. Moss, Dayton; Secretary, Dr. F. A. Lambert, Columbus; Treasurer, Dr. David S. White, Columbus.

Thirty-five new members were voted into the association, making the present membership slightly over three hundred.

The very excellent committee reports have been a marked feature of our last few annual meetings.

The program follows.

Influenza in the Horse with special reference to the Pectoral Form.
Dr. N. D. Backus.....Elyria
Discussion by—Dr. W. A. Brown, Columbus and Dr. A. E. Metzger, Clyde.

The Significance of the Fever Complex in the Cow.
Dr. R. A. Greenwood.....Painesville
Discussion by—Dr. R. J. Bernath, Wauseon and Dr. George Kinsey, Wheeling, W. Va.

The Surgery of Fistulous Withers.
Dr. Louis A. Merillat.....Chicago, Ill.

Some Conditions in Hogs Simulating Hog Cholera not amenable to the serum treatment.
Dr. O. D. Maddux.....Washington, C. H.
Discussion by—Dr. Howard Miller, Columbus and Dr. C. W. Fogle, Leipsic.

Fractures.
Dr. E. V. Hover.....Convoy
Discussion by—Dr. W. G. Cook, Findlay and Dr. H. Worcester, Middletown.

DINNER SESSION

Toastmaster.....President F. F. Sheets
Toasts:—
Hon. Ralph D. Cole.....Columbus
Hon. John F. Kramer.....Mansfield
Dr. John V. Newton.....Toledo

Dr. Walter Shaw.....Dayton
Music by the University String Quartette.

VETERINARY CLINIC BUILDING

Report of some cases which did not recover.
Dr. C. B. Frederick.....Canton
Discussion by—Dr. F. R. Butz, Cincinnati and Dr. Sidney Meyers, Wilmington.

Some points relative to passing the Stomach Tube in the Horse.
Dr. John N. Shoemaker.....Columbus
Discussion by—Dr. C. H. Case, Akron and Dr. R. D| Way, Cleveland.

Operation—Fistulous Withers.
Dr. L. A. Merillat, Chicago, assisted by Dr. J. H. Blattenberg, Lima.

The Technique of Post Mortem in the Field.
Dr. L. A. Merillat and Dr. J. H. Blattenberg.

F. A. LAMBERT, *Secretary.*

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SOUTHERN TIER VETERINARY MEDICAL ASSOCIATION

The second semi-annual meeting was held at Elmira, December 30, 1915, at the Hotel Rathbun. The forenoon clinic was held at Dr. Battin's hospital at which operations for quittor were performed by Drs. Muldoon and Axtell. The following papers were presented and discussed: Atypical Cases of Blackleg, Hugh M. Barnes; Treatment of Thoroughpin, J. N. Frost; Swamp Fever, C. P. Fitch.

Dr. Wills of the state department of agriculture made some extemporaneous remarks on Veterinarians and Tuberculin Testing. He asked for the co-operation of the association in eliminating fraudulent and dishonest tests. The following resolution was passed: Resolved, that the Southern Tier Veterinary Medical Association severely condemns the practice of fraudulent tuberculin testing and that the association act in conjunction with the state department of agriculture in stamping out the practice. The next meeting will he held at Owego.

C. P. FITCH, *Secretary.*

COMMUNICATIONS

ACROSS A GAP OF 2,000 YEARS.

"Caesarian Section in Boston Bitch" (Am. Vet. Review, June, 1915, XLVII, 355) has an apparent parallel of approximately twenty centuries ago; then the idea of this operation (however called) was more familiar than even today when sundry practitioners consider it safer than "twilight sleep." Medical Aspects of the Greek Anthology (J. D. Rolleston in *Proceedings, Royal Society of Medicine,* 1913-14, VII, ii, Hist., at p. 55; also in *Janus,* 1914, XIX, at p. 130) has the following (at the end, the contrast being between the goddess of childbirth and the god of the sword and other edged-implements):—

"The following epigram by Philippus (ix, 311) on cicatricial stenosis of the vagina in a bitch obstructing parturition deserves to be quoted:—

A bitch which rivalled swift stags in its course was wounded in the birth passage when pregnant and all the parts as it cicatrised closed up in time, and the hour for delivery arrived. While it was howling terribly, a man cut it with a knife and the dear little pups leapt forth from the womb. There is no need for Artemis to help in delivery since Ares acts as midwife."

ALFRED ELA, Salem, N. H.

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REVIEWS

MEDICAL AND VETERINARY ENTOMOLOGY

A Textbook for Use in Schools and Colleges as well as a Handbook for the Use of Physicians, Veterinarians and Public Health Officers. 8°. 393 pp., 228 figs. By William B. Herms. New York, 1915. The Macmillan Company.

This book constitutes a very valuable reference for persons working along medical lines. It would also serve as an excellent text for a course in medical or veterinary entomology or tropical medicine. For the purposes of the one year course in general parasitology as given in most veterinary colleges at the present time this

book would be of great service as a book of reference, though it is unlikely that the time at present devoted to parasitology or medical zoology in these schools would permit of the use of a book of 393 pages as one of several texts.

The numerous insects which may carry disease mechanically are given ample discussion in the book, and the various parasitic insects, ticks, etc., together with the parasites which some of them may transmit as intermediate hosts, are discussed at length. Aside from the chapters on insects of medical interest and importance, the book gives a general discussion of parasites and an illustrated review of the subject of insect anatomy which will be helpful to the physician or veterinarian who may be confronted at times with papers and discussions which assume too much with reference to his knowledge of this subject. There are some helpful keys; more of these, such as a key to the larval botflies of the horse, could be included in a later edition to advantage.

The Veterinarian will find this book of value. It discusses and figures the insects and related arthropods which may be met with in practice as parasites or otherwise injurious forms, and gives detailed methods for treatment and prophylaxis, and in some instances outlines a program of eradication.

For future editions of this interesting and valuable work—and it is worth mentioning that the book is written in a wholly readable style and amply illustrated—the reviewer would suggest that books on medical entomology might well place more emphasis on what has not yet been recognized in books of that kind as the important role of such non-parasitic forms as the Orthoptera, moths, beetles, earwigs, etc., as intermediate hosts of parasitic worms (nematodes belonging to the Spiruridae, Mermithidae, Gordiidae, etc., and such tapeworms as *Hymenolepis*); that the abbreviation n.g. (new genus) be dropped from keys copied from the publications in which such genera were new; and that more space be given to the vexatious topic of demodectic or follicular mange, its bacterial complications, medicinal and vaccine treatments, etc. The book contains very few misprints, is up to date on the topics treated, and is in all ways a credit to the author and publishers.

M. C. Hall.

LYMPHATIC GLANDS IN MEAT PRODUCING ANIMALS

P. GODBILLE, Section Chief
of the Sanitary Veterinary Inspection of Paris and the Department of Seine.
Translated by ALEXANDER LIAUTARD and D. ARTHUR HUGHES.
New York, W. R. Jenkins Co., 1915. Pp. VIII—175.

The purpose of this little book, as stated in the preface "is to indicate how the organs can be most readily found because of their precise topographic relations."

The book is divided into two parts. Part I consists of 48 pages of text and 34 pages of figures and their explanations. This part is divided into 10 chapters and is devoted to the location of the lymph glands in cattle, (4 chapters); swine, (4 chapters); sheep and horses, (2 chapters).

Part II consists of 44 pages of text and is divided into 6 chapters; 1 The normal appearance of these glands and their products. 2 The white globules or leucocytes. 3 The variations in structure of normal lymphatic glands and the reasons for them. 4 The pathological alterations occurring in lymphatic glands of meat producing animals. 5 The parasitic alterations. 6 The microbian alterations.

The book is completed by an exhaustive index of 11 pages.

Doubtless this little work will prove helpful to many of those for whom it was prepared.

The type is large and clear and the press work is excellent. It is to be regretted that the translators did not conform to the generally accepted modern idea of anatomical nomenclature.

The introduction of such words as sus-sternal, sus-tracheal, sus-epitrochlear, etc, is not to be commended. Some mistakes have been noted in the labeling of a few of the figures. Fig. 3 No. 9 and 13 refer to the same organ. Fig. 5 A the rethopharyngeal lymph gland No. 5 should be at the medial side of the stylohyoid; also No. 7 is not the foramen caecum. In Fig. 11, No. 1, 3 and 8 are incorrect.

The aim of the translators to assist in the diffusion of a more general and exact knowledge of the topography of the lymphatic system is most praiseworthy and most heartily to be commended.

G. S. H.

NECROLOGY

JOHN DESMOND

Veterinary Surgeon John Desmond of Adelaide, South Australia, died November 20, 1915. Dr. Desmond was formerly chief government veterinary surgeon, chief inspector of cattle, and government bacteriologist for South Australia.

MADISON BUNKER

Word has been received of the death of Dr. Madison Bunker, which occurred on January 16. He graduated from the Massachusetts Agricultural College in 1875 and later from the American Veterinary College. He was an ex-president of theMassachusetts veterinary medical association and a past member of the A. V. M. A.

J. F. W.

WALTER G. BOEHME

Dr. Walter G. Boehm died suddenly at his home in Georgetown, Ohio, January 11, 1916. The cause of his death was unknown. He was a graduate of the College of Veterinary Medicine at Columbus, Ohio in the class of 1908, and was a member of the Ohio State Veterinary Medical Association. He was a brother of Edwin Boehme, D.V.M., of Batavia, Ohio.

V. H. CARTER

Dr. Carter of Haskins, Ohio, died January 17, 1916 as the result of an attack of pneumonia. He was a graduate of the Grand Rapids Veterinary College of the class of 1911 and was a member of the Ohio State Veterinary Medical Association. Mrs. Carter is in the hospital with pneumonia and an only child, a small boy, is also in the hospital as the result of a recent operation.

MISCELLANEOUS

Dr. W. J. Cleveland of Rocky Ford, Colorado, has removed to Galt, Iowa to take charge of the Wall Lake Stock Farm.

Dr. L. A. Maze, who has been at Chelsea, Mich. the past four years has accepted a position with Parke, Davis & Co., as assistant veterinarian at their biological farm at Rochester, Mich. Dr. Maze assumed his new duties January 15.

The Pennsylvania State Veterinary Medical Association will hold its annual meeting at Pittsburgh February 22 and 23.

The next meeting of the Alabama Veterinary Medical Association will be held at Auburn, Alabama, February 18 and 19.

A competitive civil service examination will be held on March 15, for the position of veterinarian, Bureau of Animal Industry and Quartermaster Corps.

Dr. Ludwig P. Pine, a veterinarian in New York City, committed suicide by taking ether. Despondency over the death of his wife several months ago is announced as the cause.

W. I. Francisco of Kalamazoo, Mich., has been appointed veterinary inspector and is to be stationed at Sioux City, Ia.

Veterinary Inspector E. K. Ward has moved to Ardmore, Oklahoma, to begin a campaign for the elimination of the cattle tick in Carter county.

Mayor Green of Kansas City, Kansas delivered the address of welcome at the meeting of the Kansas Veterinary Medical Association at that city.

The firm of Miller and Lang was dissolved December 23rd. Dr. E. M. Lang has established a veterinary hospital at 513 E. Market St. Louis, Ky. with indications for a successful practice.

At the December meeting of the California State Veterinary Medical Association at San Francisco, C. L. Roadhouse was elected president; G. J. Donnelly, Vice-President; F. M. Hayes, Secretary, and James Boyd, Treasurer.

A "Dr." C. R. Wildes has finished a rather vivid career by robbing a bank in Chautauqua County, Kansas. He has been placed in charge of the live stock hospital at the state prison.

According to newspaper reports a man in a hospital at Santa Monica, California, is said to be dying from foot-and-mouth disease.

Dr. L. R. Groner, a veterinarian of Bath, Pa., and president of the first national bank is reported critically ill.

The responsibility for the outbreak of the foot-and-mouth disease in Michigan is placed upon the department of Agriculture by State Veterinarian Dunphy, who claims that the report of the secretary is misleading in this respect.

The state veterinarian of North Dakota has issued a warning that parties purchasing stallions should take precautions to determine that the animals are free from transmissible disease and unsoundness and conform to the North Dakota stallion law.

The latest statistics of the U. S. department of agriculture relative to the number of domesticated animals in the United States compared with January 1, 1915, is as follows: In numbers, horses have decreased 29,000; mules increased 86,000; milch cows increased 726,000; other cattle increased 2,386,000; sheep decreased 794,000; swine increased 3,429,000.

In average value per head, horses decreased $1.73; mules increased $1.51; milch cows decreased $1.43; other cattle increased $0.11; sheep increased $0.67; swine decreased $1.47.

In total value, horses decreased $39,634,000; mules increased $16,553,000; milch cows increased $8,781,000; other cattle increased $83,759,000; sheep increased $29,661,000; and swine decreased $65,589,000.

The total value of January 1, 1916, of all animals enumerated above was $6,002,784,000, as compared with $5,969,253,000 on January 1, 1915, an increase of $33,531,000, or 0.6 per cent.

The blue cross society is doing a great work in the European war. Through its good offices much of the pain which the horses suffer on the battle front, from sickness and wounds, is relieved. the society is doing its best to relieve the sufferings of these dumb animals and to check the waste of horse life irrespective of nation-

ality. Contributions are welcome and donations may be sent directly to the Blue Cross Society, 58 Victoria St., London, S. W. England.

The *Breeder's Gazette* believes, after the recent encounter with foot-and-mouth disease, that the time has come when the general standard of the veterinary profession in this country must be marked up. It recommends the establishment, at the Chicago Union Stock Yards, of an institution, under the supervision of the University of Illinois, which shall rise to the full stature of all that a twentieth century veterinary college and experiment station ought to be, and that nothing short of the best of everything in the way of equipment and the best trained men in Europe and America should be employed. Such a project was attempted a number of years ago but failed to materialize.

During the nine months ending January 1 the state veterinarian's department of Nebraska inspected 176,138 head of cattle for scabies. The total number found infected was 28,718. These and 41,982 that had been exposed were dipped. The inspectors found 105,000 head infected. The disease has existed in western Nebraska and other western states for many years and the state with the co-operation of the government is making special efforts to wipe it out.

A chapter of the Omega Tau Sigma fraternity has been installed at the Veterinary College at the George Washington University at Washington, D. C.

Dr. H. T. D. Lackie who has been assisting Dr. F. F. Dolan for the past two years has decided to locate at Arenegard, N. D.

There were thirty-one candidates for veterinary license certificates at the recent examination given by the Minnesota state veterinary medical examining board.